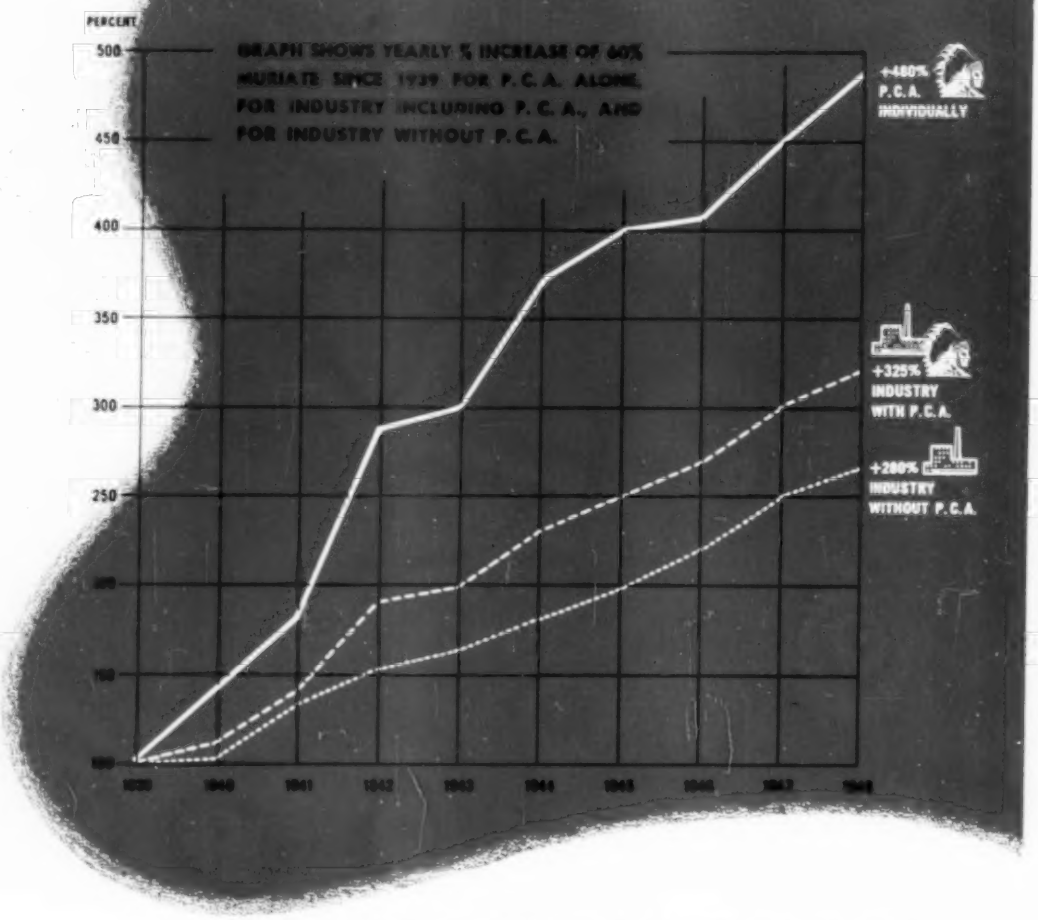
Vol. IV, No. 12 December, 1949

AGRICULTURAL CHEMICALS

In This Issue:

Statutory Limitations of Residues Discussed • Sulfur and Life • National Fertilizer Association Meets Phytopaths Meet in New York • Eastern AAEE Report • California Fertilizer Association Meets on Coast • USDA Labeling Requirements • Northeastern Weed Conference for NY; N. Central in S. D.

We've been doing some figuring...


PERCENT
500
450
400
350
300
250
GRAPH SHOWS YEARLY % INCREASE OF 60% MURIATE SINCE 1939 FOR P. C. A. ALONE, FOR INDUSTRY INCLUDING P. C. A., AND FOR INDUSTRY WITHOUT P. C. A.
+480% P.C.A. INDIVIDUALLY
+325% INDUSTRY WITH P.C.A.
+280% INDUSTRY WITHOUT P.C.A.

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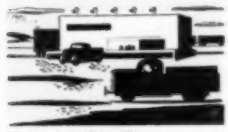

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Penco BHC Technical (36% Gamma Isomer)
Penco BHC W-12 (12% Gamma Isomer Wettable Powder)
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Penco Hi-Gam 25 (Contains Lindane)
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Penphos W-15 (Wettable Parathion)
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Penco Fruit Fungicide 341C
Kryocide® (Natural Cryolite)

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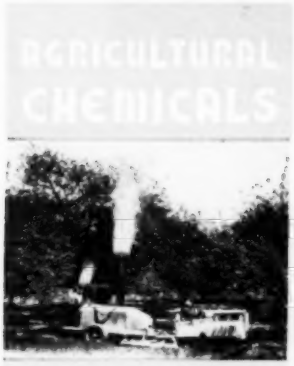

THIS MONTH'S COVER

Sulphur has many agricultural uses, both as a soil nutrient and as a pesticide. Here is a wettable lime sulfur spray being applied to fruit trees as an insecticide. See Article, "Sulfur and Life," page 25, this issue. (Photo courtesy of Texas Gulf Sulphur Co.)

DECEMBER 1949
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Important to Distributors of Insecticides

THIS TIMELY MESSAGE FROM DU PONT IS NOW APPEARING IN CURRENT ISSUES OF LEADING FARM PUBLICATIONS

Du Pont Brings You

NEW HELP TO FIGHT FLIES

"MARLATE" 50 and DU PONT DAIRY CATTLE SPRAY

(50% Methoxychlor Insecticides)

To Livestock and Dairy Farmers: These long-lasting fly killers will be available next season, and you will want to know how to use them. The facts presented here are based on eight years of Du Pont research, intensive study by Federal and State scientists and two seasons of practical results on farms and ranches.

Relative Immediate Hazards to Humans of Some Common Insecticides

Insecticides	Ratio
PARATHION	1714
NICOTINE	600
TOXAPHENE	100
ROTENONE	100 (to 2)
GBH (LINDANE)	48
DDT	24
CHLORDANE	12
PYRETHRINS	4
TDE (DDD)	2.4
METHOXYCHLOR	1

This table is taken from the Quarterly Bulletin of Association of Food & Drug Officials of U.S., Vol. XII (No. 3), pp. 82-89, July, 1948.

Methoxychlor is found to have the lowest hazard in terms of immediate toxic effect. This is indicated above by the numeral 1. Figures for other insecticides show their toxic hazards by comparison with methoxychlor.

In addition, methoxychlor presents no delayed hazard from long-term consumption of small residues which might remain in milk, vegetables or fruit products or forage crops, whereas some of the other insecticides which are relatively safe may offer considerable hazard in this respect.

If the flies were especially bad around your place the past two or three years, it's not surprising. There simply have been lots more flies everywhere—a whole lot more.

That's a fact, and it may be serious. Nobody knows just what caused it. Furthermore, nobody knows how much sickness flies caused last summer, nor what they cost the nation's farmers in lower production and in extra work to try to keep them under control.

But there is a bright side to this problem. It's news of an insecticide that may well be significant in turning back the fly population and many other troublesome insects, too. It is exceptionally safe—the nearest ideal fly killer that science has yet discovered.

A Product of Du Pont Research

The chemical name of this product is methoxychlor (pronounced meth-ox-e-klor). While some farmers have already had a chance to use it, you'll find it easier to get this coming season; and a few simple facts will help you get excellent results with it.

As you know, a whole new family of insect killers cropped up right after the war. DDT is the most famous member of the group. Others are BHC, chlordane, toxaphene and lindane. All of them are known to chemists as chlorinated hydrocarbons. Methoxychlor is in that class, too. While they're all different, they do have one thing in common: they are all residual insecticides. This simply means that when you use a dust or spray containing one of these chemicals, the chemical itself stays active and keeps on killing insects when they come along and walk on it or feast on it, as the case may be. In contrast, rotenone and pyrethrum, two long-familiar insect killers, lose their power soon after they are released.

Effective for Weeks

Methoxychlor has this residual action for weeks and even months against horn flies, stable flies and house flies, mosquitoes, fleas and lice. And it acts much the same way against many insects that attack crops and fruit trees.

The most outstanding fact about methoxychlor, compared to all other residual fly sprays, is its relatively non-poisonous characteristic. That means that it is exceptionally safe for people, for livestock and other warm-blooded animals. Any insecticide is essentially a poison, and you should always look on it as such. But in terms of immediate toxic hazard to people and animals, methoxychlor is 24 times safer than DDT, 48 times safer than lindane (the gamma isomer of Benzene Hexachloride), 12 times safer than chlordane and 4 times safer than pyrethrum.

Safe to Spray on Cows

This safety factor, combined with its long residual action, is what makes methoxychlor a major scientific milestone. Du Pont also makes DDT and Benzene Hexachloride, and has had a great deal of experience with both of them. Each has its special attributes, and each has uses for which it is outstanding. But methoxychlor was pioneered by Du Pont scientists who started work in 1942 in search for a better product that

DU PONT METHOXYCHLOR INSECTICIDES ASSURE HIGH EFFICIENCY WITH EXCEPTIONAL SAFETY

would indeed combine the greatest effectiveness with maximum safety.

It was this safety factor which led Federal agencies, including the U. S. Department of Agriculture and the Food and Drug Administration, to recommend methoxychlor for use on dairy animals and in dairy barns. That was last spring, and this action applied expressly to sprays for use on dairy cows, in dairy barns, in milk houses and milk plants, on crops to be fed to dairy cows, and on beef cattle that are to be slaughtered within 30 days. Methoxychlor has little or no tendency to appear in the milk of animals treated as directed. It does not build up in the fatty tissues of livestock, as is the case with some of the other new insecticides.

Sanitation Needed, Too

Yes, methoxychlor is recommended for spraying the cows themselves. One good spraying (of the animals and premises) should be effective for weeks, not for just the hour while you're milking. This brings up the question of whether flies have a way of getting tougher so methoxychlor or lindane or DDT won't kill them. Perhaps you've heard reports to that effect.

It may be true that some flies do die quicker than others; but every farmer should carefully examine all available facts regarding the efficiency of insecticides. And in any fly control program it is just as essential to clean up manure heaps and refuse piles as it is to spray the buildings and the animals. In fact, two points—(1) sanitation and (2) correct use of the insecticide—are what make the difference between success and failure.

The clean-up should come before you spray, of course. If the manure is deep or there are piles of refuse where flies breed, you can't expect good results, because flies produce a new generation every week or so in hot weather. Thus in some seasons they can hatch faster than you can kill them off with any chemical unless their breeding places are removed.

Two Du Pont Formulations

This coming season, you will be able to purchase two Du Pont formulations of methoxychlor. Both are wettable powders, ready to mix with water for use on the cattle, in stables, in the milk house or around the home.

One is "Marlate" 50, a 50% methoxychlor preparation designed especially for large-scale users who usually have power equipment. While

DU PONT

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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Safe to use on the cow herself or on crops that she will eat

it is effective as a fly spray, it is also used widely by fruit and vegetable growers to control insect pests of those crops. Here again, its safety is a major advantage, since it can be used on food products close to the time they are harvested.

Facts In Brief

1. **Exceptionally safe** when used as directed. Methoxychlor is the safest long-lasting fly killer yet known.
2. **Safe to spray** directly on cows, or to use as an insecticide on crops they will eat.
3. **Safe and effective** in the barn, the milk house, your own home and around the premises.
4. **Safe to use** in creameries, egg rooms, food and feed storage rooms or food processing plants.
5. **Safe to use as an insecticide spray** or dust close to harvest on vegetables, fruit or other crops.
6. **Kills horn flies,** stable flies, house flies, mosquitoes, fleas and lice when used as a fly spray; kills many insects that attack vegetables, fruit and forage crops.
7. **Long residual action.** Stays effective for weeks or even months after you use it.
8. **Available in** two Du Pont formulations —"Marlate" 50 and Du Pont Dairy Cattle Spray. Both are concentrated wettable powders, ready to mix with water.

"Marlate" is a Registered Trademark of E. I. du Pont de Nemours & Co. (Inc.)

There is no danger of toxic residues with methoxychlor insecticides when used as directed.

The other formulation is Du Pont Dairy Cattle Spray, also a 50% methoxychlor concentrate especially for dairymen who need only small quantities at a time. It comes in ¼-pound, 1-pound and 2-pound containers, and a pound makes enough for one thorough spraying of 35 head.

Simple Rule for Use

Scientists work out correct dosages and spray methods with exacting care. So read the directions when you use "Marlate" 50 methoxychlor insecticide or Du Pont Dairy Cattle Spray. Let the directions guide you so you will be sure to get efficient results.

Wet each animal, don't just dampen her. Spray her all over and spray until the solution begins to run off. The same idea applies when you spray the stable, the milk house and the barnyard. The better job you do, the fewer times you'll need to do it.

For Fruit and Vegetables

"Marlate" 50 methoxychlor insecticide is also recommended for fruit and vegetable crops because it can be used close to harvest without the danger of toxic residues. Its killing power on insects, however, is effective and lasts for weeks. Growers who use "Marlate" 50 get excellent insect control, and at the same time protect the eventual consumer from harmful toxic effects.

Look at the Record

Here are some typical reports on actual results with methoxychlor insecticides:

CALIFORNIA: "Marlate" gave good fly control on animals and buildings where sanitation practices were carried out.

NEW YORK: "Marlate" gave excellent results in controlling many insects on animals and in buildings in Orleans County.

NEBRASKA: "Marlate" gave excellent fly control on dairy cattle and in dairy barns, where sanitation practices were followed.

FLORIDA: In Orange County and surrounding areas, "Marlate" has given generally good control of flies.

NORTH and SOUTH CAROLINA: Growers report that "Marlate" is better than rotenone for the control of Mexican bean beetle (adults and larvae) and other insects on beans. "Marlate" dust also gives excellent control of leaf hopper on beans.

LOUISIANA: In Lafayette, investigation by USDA officials show excellent results in the control of sweet potato weevil to date.

CALIFORNIA: In experiments, methoxychlor gave better kill of western grape leaf skeletonizer than cryolite (50%), DDT (5%), DDD (5 and 10%) or parathion (1%).

WASHINGTON and OREGON: State and Federal investigations suggest "Marlate" for the control of the cherry fruit fly because of its efficiency and long residual effect.

"New Help To Fight Flies"

You should have this 16-page, authoritative booklet. Tells how to get complete fly control; the best sanitary practices to follow; how to use methoxychlor insecticides effectively, and other useful information which will help you to conquer flies on your farm or ranch. Use the coupon.

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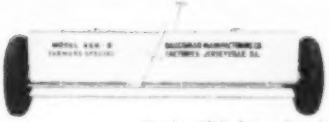

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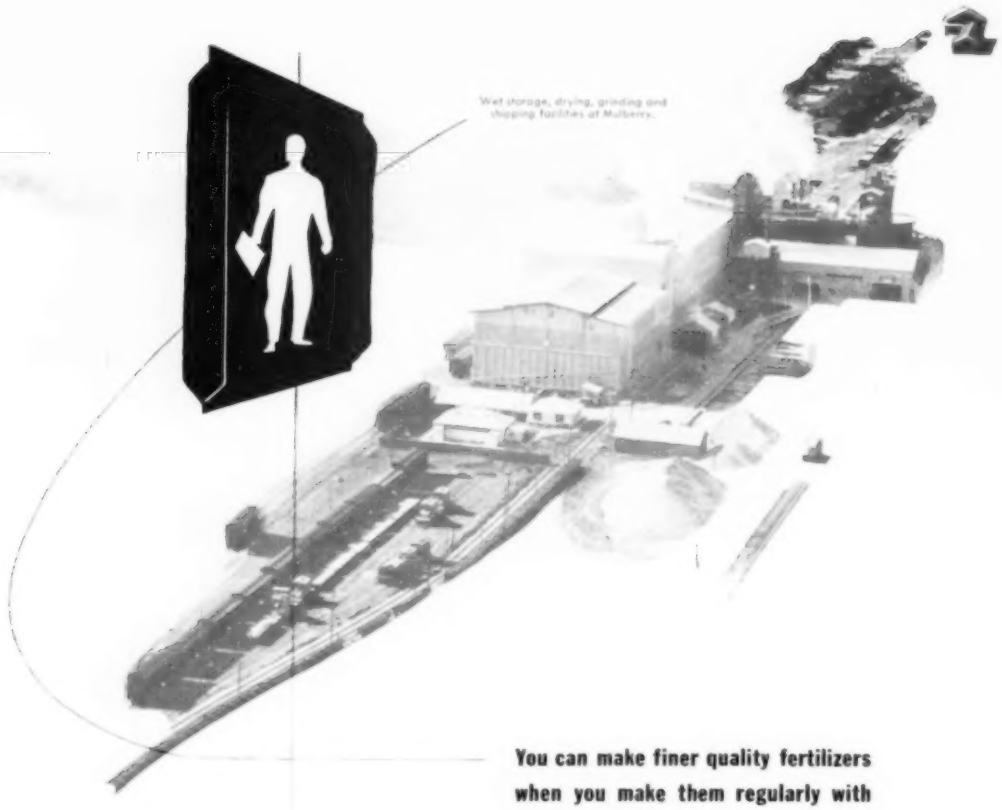

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U. S. Patent No. 2,427,578

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Place 2 to 4 tablespoonfuls of mixed bait in locations used or frequented by rats or mice, and protect from dogs, cats, livestock, etc., where necessary by means of bait boxes, cages, etc.

Baits should be examined daily and replaced when baits have been consumed or when they decompose, mould or become sour.

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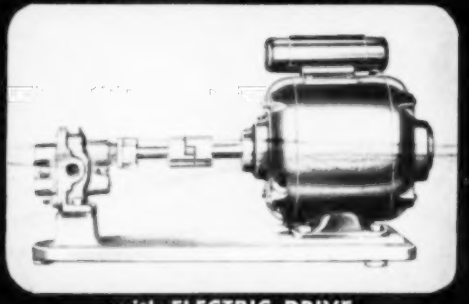

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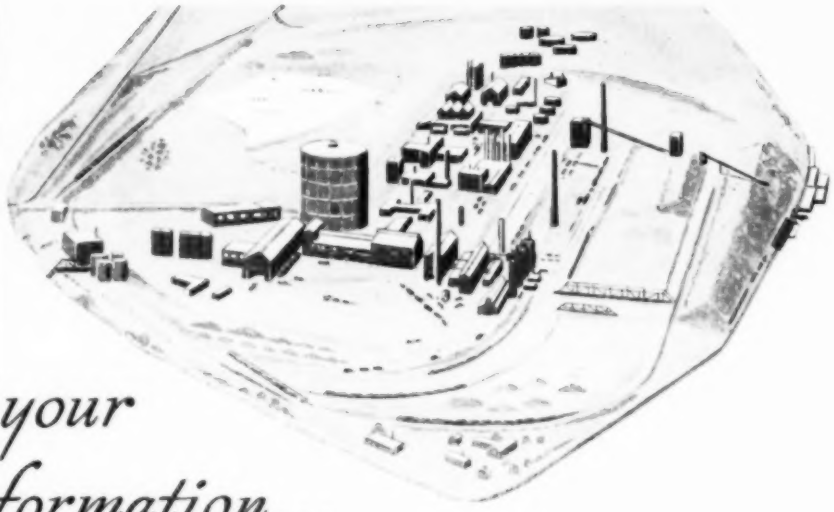

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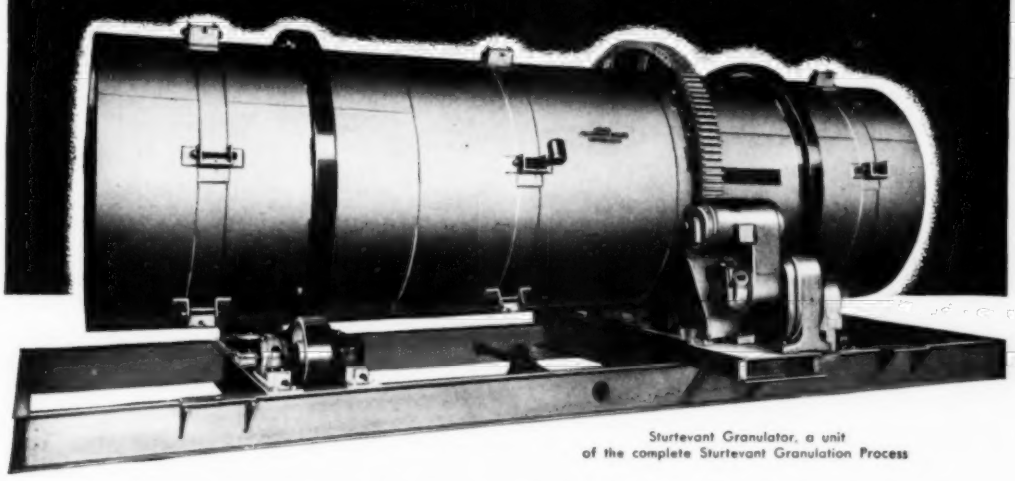

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THE EDITOR COMMENTS

INSECTICIDE manufacturers have been concerned about the recent proposals to include DDT and other insecticides in the new U. S. Pharmacopoeia. The trade naturally shrinks from such a move, for once classified as "drugs," these insecticides would be subject to the provisions of the Federal Food, Drug and Cosmetic Act.

Added to the present requirements of the Federal Insecticide, Fungicide and Rodenticide Act with which the pesticide trade must comply through registration, proper labeling, and the like, such a development would complicate matters no end. A provision that USP references apply only to materials indicated for medical use should cover the matter satisfactorily. Not many insecticide labels carry such statements.

THE words of George D. Childress of the Civil Aeronautics Authority, Washington, D. C. at the recent first annual meeting of the Washington State Aerial Dusting and Spraying Conference should be re-echoed around the trade. Mr. Childress stressed the fact that education instead of regulation, is the answer to the effective and safe use of aircraft in agriculture. He listed a number of points which he regards as essential to success in any aerial custom dusting or spraying enterprise. These included in the first place, good equipment; a training school to educate all workers in agricultural aviation; a code of ethics; and a respect for the rights and property of others.

If all of these points were lived up to conscientiously, we are sure there would be fewer stories in the papers and trade press about irresponsible operators dumping poisonous dusts helter-skelter over the countryside and otherwise goading the public to urge restrictive legislation to halt such activities.

Mr. Childress knows whereof he speaks. . .and many well-qualified custom operators do too. . . for it doesn't take too many unfortunate "incidents" to spoil the business for everyone.Educate the individuals who pilot the planes so that they know all that is involved, and ninety-nine percent of the troubles will disappear.

COMPLETION of its first hundred years will be observed by the commercial fertilizer industry in 1950. That the first century of fertilizer mixing has brought tremendous gains is too obvious to dwell upon. . .but the approaching centennial does give one an opportunity to stand off and look at the picture with a degree of objectivity.

Since agriculture is the basic industry of the U. S. or of any other country, the supply of fertilizer materials is of unusual importance; soil fertility conditions being what they are. The industry which has supplied soil nutrients to American agriculture for the past century deserves a special nod of recognition at this time. It stands in line for commendation on a number of counts. . .not the least of which is the fact that not long ago, when materials were hard to get and every possible obstruction to full production was hindering manufacturers of fertilizer materials, the industry plodded on to supply most of the demand.

This same doggedness has characterized the industry throughout its hundred year history. It has had to battle. . .and still does. . .deep-seated prejudice against "chemicalized" foods; it has contended with depressions during which farm income sank to record depths; and all through the years, it has had to cope with constant demands to help increase farm yield.

In looking at the industry today. . .on the eve of its centennial, we can't help saying "well done". . .so far. But present-day knowledge has scarcely scratched the surface of all that remains to be learned about soil technology, plant nutrition, etc. The fertilizer industry will continue to keep pace with advancing knowledge, and who knows? perhaps the next 100 years will see developments which will shade those of the past century!

Guest Editorial written especially for this issue of Agricultural Chemicals.

Everyone has stake in Residue Tolerance Hearings

By

Charles E. Palm
Department of Entomology,
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Ithaca, N. Y.

FOOD is vitaliy essential in the economy of every nation. In the production of all food products, competition from injurious insects and plant diseases is ever present and offers a perennial threat to our food supply. The modern miracle of agricultural production in our own country has developed large acreages of crops in adjacent areas which tend to favor the development of insect pests and plant diseases. In recognition of the need for more positive control over these pests than can be assured by natural means, the chemist, the entomologist, the plant pathologist and the equipment manufacturer have focused their efforts on the development of chemical control of insects and plant diseases as a means of assuring the farmer, and in turn the consumer, of the production of adequate food supplies. America has pioneered in many phases of insecticide and fungicide development until at present, with the coordinated effort among all members of the team working for better pest control, the American farmer has come to rely upon insecticides and fungicides as an essential part of almost every production program.

For many years the available supply of chemicals useful as pesticides was rather limited. The continued use of these materials, year after year, enabled us to develop a good background of knowledge about them. Within the past decade we have witnessed a tremendous development in the field of synthetic organic insecticides and fungicides. Many of the new materials are more effective as pesticides than the older more established products; they have already demonstrated their importance in food production. But with their development and use have come new problems. We have found need for teamwork among the scientists who are working to develop the facts about these new chemicals upon which decisions can be based for recommending their safe use. There is little need to dwell on the uncertainty, the confusion, the dilemma

(Turn to Page 75)

Statutory Limitation of INSECTICIDAL RESIDUES on Food

by

John D. Conner

Member of the Bar,
District of Columbia

MAN'S efforts to protect his food supply from the ravages of insect predators reach far back into antiquity. His preoccupation with famine arising from his inability to protect his food against insect plagues predated by far his efforts to assure purity of that food supply by legislation.[1] Until recent years the efforts to achieve these two ends have proceeded along lines largely unrelated.

Congress, for the first time insofar as legislation is concerned, recognized the inter-relationship of these two problems when it considered and enacted the Federal Food, Drug and Cosmetic Act of 1938. Under the Food and Drugs Act of 1906, the residues of economic poisons were considered on the same basis as any other added adulterant. Section 7 of that law specified that

> "* * * any article shall be deemed to be adulterated * * * if it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health * * *."

Necessity of use of the toxic or deleterious substance had no legal relevancy in determining whether a product was adulterated by virtue of its bearing or containing a residue of that toxic or deleterious substance.[2]

In drafting the 1938 Act, Congress recognized that the continuation of this rigid criterion contained in the 1906 Act would be only an impractical over-simplification of what was becoming a complex problem. This problem was stated concisely in the Report of the House Committee on Interstate and Foreign Commerce:

> "It is well recognized that an adequate fruit and vegetable supply could not to brought to maturity without the use of toxic insecticides and fungicides. But the situation is made extremely complex by the number of poisonous substances used for different crops in different localities, and by contaminations which unavoidably occur in many manufacturing processes."[3]

The drafters of the 1938 Act as a first step in meeting this situation restated as a general principle the provision contained in the 1906 Act that any article is adulterated if it contains any added poisonous or deleterious substance that may render it injurious to health.[4] The desired flexibility was then provided by the insertion of an alternative provision which authorizes an administrative official to establish a less stringent criterion for the use of any poisonous or deleterious substance which he finds to be required in the production of food.[5] Since, however, Congress was thereby delegating to a member of the executive branch of the government part of its legislative authority, detailed safe guards upon the exercise of this authority were written into law.[6] These will be discussed in more detail later.

The developments of the past ten years have justified the determination of Congress that the question of spray residue tolerances is too complicated to be submitted to the single criterion pattern of the 1906 Act. Whether the alternative pattern provided by Congress is a satisfactory solution must for the time being remain unanswered. It has not yet met the test of practicability. What appears to be the only enforcement proceeding based upon an allegedly excessive residue of an economic poison under the new act was brought under section 402 (a) (1) and could just as well as have been brought under section 7 of the 1906 Act.[7]

1. Every "herb of the land and all the fruit of the tree" were devoured by the locust plague in Egypt (Exodus 10:15) long before the tenets of food sanitation were proclaimed by Levitical law.

2. Congressman Lea drew attention to this lack of flexibility and discretion in the 1906 Act at the time the 1938 Act was under discussion. He said: "At this point I call attention to the question discussed a while ago as to spray residue on fruit. * * * The only method of prosecuting in connection with that condition at the present time is to treat spray residue as an adulteration." 89 Congressional Record 10229, May 31, 1938.

3. Report of House Committee on Interstate and Foreign Commerce, House of Representatives Report No. 2139, 75th Congress, April 14, 1938.

4. Sec. 402(a) (1).

5. "Sec. 402. A food shall be deemed to be adulterated—

(a) * * * (2) if it bears or contains any added poisonous or added deleterious substance which is unsafe within the meaning of section 406; * * *."

"Sec. 406. (a) Any poisonous or deleterious substance added to any food, except where such substance is required in the production thereof or cannot be avoided by good manufacturing practice shall be deemed to be unsafe for purposes of the application of clause 2 of section 402(a); but when such substance is so required or cannot be avoided, the Secretary shall promulgate regulations limiting the quantity therein or thereon to such extent as he finds necessary for the protection of public health, and any quantity exceeding the limits so fixed shall also be deemed to be unsafe for purposes of the application of clause (2) of section 402(a). While such a regulation is in effect limiting the quantity of any such substance in the case of any food, such food shall not, by reason of bearing or containing any added amount of such substance, be considered to be adulterated within the meaning of clause (1) of section 402(a). In determining the quantity of such added substance to be tolerated in or on different articles of food the Secretary shall take into account the extent to which the use of such substance is required or cannot be avoided in the production of each such article, and the other ways in which the consumer may be affected by the same or other poisonous or deleterious substances."

6. See the provisions of sec. 701, quoted in footnote 17, post.

7. U. S. v. 1,240 Sacks of Apple Chops, FDC No. 11,744.

The only proceeding to date under section 406a was for the purpose of establishing fluorine spray residue tolerances on apples and pears. The regulation promulgated by the Administrator in that proceeding was in effect invalidated by the Circuit Court of Appeals of the United States for the 9th Circuit in a review proceeding.[8]

The hearings which have been announced to start on January 17, 1950, to establish tolerances on all economic poisons required in the production of fresh fruits and fresh vegetables, will be the first comprehensive test of the practicability of the residue tolerance provisions of sections 402 and 406. While analysis of the substantive provisions of these sections will yield a preliminary answer to this question, final decision must be held in abeyance until such time as the conduct and outcome of these hearings can be appraised.

"Poisonous," "Deleterious" Defined

IN construing the substantive provisions of sections 402 (a) (1) and (2), and section 406, one cannot avoid the realization that he is proceeding primarily on dead reckoning plotted upon a chart of uncertain soundings. There are, however, a few fairly well defined basic concepts which may be accepted as a reliable point of departure.

Under section 402 (a) (1) and (2) and section 406(a), a food is adulterated only if it bears or contains a "poisonous or deleterious" substance. A first impression interpretation of the phrase "poisonous or deleterious" might readily serve as a basis for mentally excluding some of the pesticides of lesser toxicity from the operation of these sections. A review of the interpretative background of this phrase does not, however, furnish much support for this view.

The United States District Court for the Southern District of California, in a recent case, summarized the decisions interpreting the phrase "poisonous or deleterious" by stating that a food was poisonous or deleterious within the meaning of the Act "if (it) bears or contains a poisonous or deleterious substance in such amount or proportion that there exists a liability, probability or possibility that its use has the capacity or tendency to result in a * * * lack of physical or mental soundness, that is, in a departure from health * * *."[9]

In 1921, the United States District Court, Eastern District of Illinois, interpreted the phrase "poisonous or deleterious" as follows:

> "The weight of opinion of these authorities appears to be that the human body already contains substantially all of the poisons of various kinds that our present state of longevity will permit and that anything of a poisonous character added to it becomes more or less deleterious to health or in effect tends to destroy or decrease the vitality of the human body * * *. The term deleterious means to hurt or damage, and anything that is deleterious is harmful and destroying. * * * A substance, therefore, that is deleterious has a tendency to destroy. * * *."[10]

It will be noted that both section 402(a) (1) and (2) and section 406(a) deal with any product that is "poisonous" or "deleterious." Therefore, an article comes within the scope of these sections if it is either poisonous or deleterious. A review of a few typical enforcement proceedings of the Food and Drug Administration will indicate the extent to which the Food and Drug Administration has gone in considering a product to be poisonous or deleterious. In one recent proceeding, a quaternary ammonium compound was alleged to be a "poisonous and deleterious substance" when used in a beverage stabilizer (1.30 grams of quarternary per 100cc. of stabilizer, which in turn was to be used at the rate of ½ ounce to each gallon of bottling syrup). A default decree of condemnation and destruction was entered.[11]

Mineral oil has also been alleged to be a "deleterious substance" in a number of recent cases. In one, mineral oil in salad dressing was considered to be a "deleterious substance." This case was tried and judgment was rendered in favor of the government on the ground that the mineral oil was an added deleterious substance.[12] In a second case, mineral oil in salad dressing was likewise alleged to be a "deleterious substance." After trial by jury, verdict was rendered in favor of the government.[13] In another proceeding under section 402(a) (2), mineral oil in candied popcorn was alleged to be an added "deleterious substance." A default decree of condemnation and destruction was entered.[14] [15]

These cases, which are typical of numerous other proceedings in which the Food and Drug Administration has alleged the same and other similar ingredients to be added poisonous or deleterious substances, indicate the extreme liberality with which the phrase "added poisonous or deleterious substance" has been interpreted by the Food and Drug Administration. Without conceding the point, it can be questioned whether the application of these interpretations might not result in the holding that any insecticidal or fungicidal material is "poisonous or deleterious."

Standards of Permissible Use

IF an economic poison which is recommended for use on food is believed to be poisonous or deleterious, the legality or illegality of its use must then be considered under the provisions of section 402(a) (1) and (2) and section 406 (a). (See 4 and 5 ante.) In this discussion it will be assumed that the residue of an economic poison on or in a food is an

8. Washington State Apple Advertising Commission v. Federal Security Administrator (CCH 9th, 1949) 178 F. (2d) 580.

9. U. S. v. 1,240 Sacks of Apple Chops, FDC No. 11,744.

10. U. S. v. 1 Pound Can Coal Tar Color, District Court, E.D. Illinois, November 10, 1921, N. J. No. 12,652.

11. U. S. v. 22 Jugs * * *, FDC No. 20,533.

12. U. S. v. 50 Cases * * *, FDC No. 20,802.

13. U. S. v. 144 Cases Merry-Maise, D. C. New Hampshire, 1947, Vol. 1, CCH Food, Drug and Cosmetic Law Reporter, p. 7714.

14. U. S. v. 34 Cartons * * *, FDC No. 22,545. The classification of mineral oil as deleterious by the Food and Drug Administration is further witnessed by the following excerpt from its 1947 report: "Mineral oil is * * * definitely deleterious because it affects the assimilation of vitamins A and D, and of the blood clotting factor, vitamin K." See also the following cases in which mineral oil was alleged to be deleterious: U. S. v. 22 Cases * * *, FDC No. 21,893; U. S. v. 32 Cases * * *, FDC No. 21,804.

15. In recent enforcement proceedings, the following ingredients have also been alleged by the Food and Drug Administration to be poisonous and deleterious: Monochloracetic acid in beer (U. S. v. 320 Cases * * *, FDC No. 21,175), in wine (U. S. v. 177 Cases * * *, FDC No. 22,833), and in a food stabilizer (U. S. v. Arthur H. Decker, FDC No. 23,282); arsenic in soya sauce (U. S. v. 7 Gallons * * *, FDC No. 23,372); and sodium fluoride in cream neutralizer (U. S. v. Benbow Chemicals, FDC No. 24,280).

"added" substance within the meaning of these sections. In my opinion, this is the only safe assumption on which to proceed in the consideration of such residues, although a plausible argument to the contrary might be made in certain cases.[16] After pointing out that section 402 (a) (2) and section 406(a) would not apply at all and that section 402 (a) (1) would be applied under a less stringent standard in the case of a non "added" economic poison, the remainder of this article will proceed on the assumption that any economic poison residue in or on a food is "added," as that term is used in these sections.

An analysis of these sections will show that two different standards of permissible use are established. A food is considered adulterated if it fails to meet either of these tests.

The first of these two standards is that contained in section 402 (a) (1) where it is specified that a "food shall be deemed to be adulterated if it bears or contains any poisonous or deleterious substance which may render it injurious to health." This is the same standard as was contained in the 1906 law. It is beyond the scope of this article to discuss the manner in which this provision has been interpreted in the past. These past interpretations may be summarized, however, by stating that the courts have held food bearing a residue to be adulterated if there exists a reasonable probability or possibility that it might injure or be deleterious to the health of any group of persons who might consume the food. This standard by its nature requires that each individual case of a food bearing or containing a residue must be judged separately. Necessity of use of the poisonous or deletrious substance is no defense.

It will be noted that section 406(a) provides that no food shall be deemed to be adulterated under section 402(a) (1) if there is a regulation in effect limiting the quantity of the poisonous or deleterious substance which may be used in that

16. Consider, for example, the residue of an economic poison in a potato as a result of absorption from the soil of an economic poison which has built up in the soil as a result of earlier applications.

JOHN D. CONNER

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food, assuming that the residue does not exceed that limit. This will automatically preclude enforcement proceedings under this paragraph in the case of a food bearing a residue which is within the limit established by regulation. For reasons which are discussed in the next paragraph, it is also believed that after regulations are issued establishing tolerances for the residues of specific economic poisons on a specific group of food products, the Food and Drug Administration will then find it simpler to proceed under section 402(a) (2) rather than section 402(a) (1) in case any food in that group bears a residue of an economic poison not permitted by the regulation. It is believed, therefore, that after the issuance of regulations as a result of the forthcoming hearings, the provisions of section 402(a) (1) will have little or no application to economic poisons residues on fresh fruits and vegetables. It will continue to have applicability to other foodstuffs until regulations are issued limiting residues on them.

The second standard of permissible use is established by section 402(a) (2) and section 406 together. Section 402(a) (2) provides that a "food shall be deemed to be adulterated if it contains any added poisonous or added deleterious substance which is unsafe within the meaning of section 406." Section 406 in turn provides that any such substance is deemed to be unsafe "except where such substance is required in the production of any food or cannot be avoided by good manufacturing practice." It then provides that when such substance is so required or cannot be avoided, the Administrator shall promulgate regulations limiting the quantity of such substance to the extent that he finds necessary to protect the public health.

It will be noted that any residue is unsafe by legislative fiat unless it is required in the production of the food and if it is so required, there appears to be a positive obligation upon the Administrator to so provide by regulation. At this point interpretation must be reinforced with conjecture. To date the Food and Drug Administration has not taken the position that the residue of any economic poison is automatically unsafe because it is not required in the production of food. There have been indications, however, that following the issuance of the regulations limiting residues on or in fresh fruits or vegetables, the Food and Drug Administration will take the position that the use of any economic poison on such food is unnecessary unless there has been a finding by the Administrator that the use of that economic poison is necessary in the production of that specific fruit or vegetable. The far reaching significance of such an interpretation is readily apparent, particularly in the case of those new products which will come on the market after the hearings are concluded.

In my opinion, it is, therefore, mandatory that any economic poison which is to be recommended for use on a fresh fruit or vegetable shall be considered as coming within the scope of the hearings which start on January 17 in order that the uses for which it is required may be established. It becomes necessary at this point to understand the procedure which must be followed in the conduct of the hearings and the various alternative legal consequences which could result therefrom.

Hearing Procedure Outlined

THE basic procedure which must be followed is specified in section 701 (e).[17] The first requirement of this section is that a public hearing must be held upon any proposal to issue a regulation under section 406(a). Any interested person may be heard at the hearing. The second basic provision of this section is that the Administrator shall base his order on "substantial evidence of record at the hearing" and as a part of the order shall set forth detailed "findings of fact," on which the order is based. These provisions seem simple enough within themselves but they assume a formidable importance when they are considered in conjunction with their interpretive background and the additional details which have been written into the rules of practice of the Food and Drug Administration.

These requirements can be summarized by stating that each provision of the regulation must be based upon a finding of fact. Each finding of fact in turn must be based upon substantial evidence of record. A finding of fact, for example, cannot be based upon general knowledge of the Administrator, such as information which has been published in scientific literature, unless that scientific literature is made a part of the record of the hearings. The requirements of "substantial evidence" also preclude a finding of fact which is contrary to uncontradicted evidence. In the case of conflicting or contradictory evidence of record, the finding of fact of the Administrator is final for all practical purposes.

In the application of these principles to the hearing, it would appear that the first finding of fact must be on whether the particular economic poison in question is poisonous or deleterious when used on each specific fresh fruit or vegetable on which it is proposed to be used. It is assumed that this finding of fact will eliminate some specific residues from the necessity of coming under the regulation by virtue of a finding either that the residue of that economic poison when used as directed is not poisonous or deleterious, or that although the residue of that particular economic poison is poisonous or deleterious, the edible portion of the fruit or vegetable does not become contaminated by virtue of the manner of application.[18]

The alternative finding on this point would be that the use of the economic poison does leave poisonous or deleterious substance in or on the specific fruit or vegetable in question. If it does leave such a poisonous or deleterious residue, the second point for determination is whether the use of that economic poison is "required" within the meaning of section 406(a).

There is very little to serve as a standard in making this determination. The term "required" did not appear in the 1906 act since that act provided for no tolerances regardless of necessity for use. The term for that reason had no interpretative background when it was incorporated into the 1938 act, and has acquired none since then.

Mr. C. W. Crawford, Associate Commissioner, Food and Drug Administration, has recently expressed his view on this subject in the following terms:

> "As throwing further light on the purposes of the law, the language chosen to prevent the unnecessary addition of poisons is worthy of careful study. To repeat what was stated a moment ago, this language prohibits traffic in food containing any added poisonous or deleterious substance 'except where such substance is required in the production thereof or cannot be avoided by good manufacturing practice.' It will be noted that the word 'required' is used. While the meaning of this word has not yet been interpreted by appellate courts, it seems fair to assume that a real or fancied improvement in the product resulting from an added poison would not be enough, that, to satisfy the law, the added substance, actually must be essential to production. It appears Congress regarded the addition of poisons to our food supply as too hazardous to permit, except in the face of a real necessity."[19]

In other words, under this interpretation a "real* * *improvement in the product" is not sufficient but the use of the economic poison must be "essential to production" to justify the establishment of a tolerance. In view of Mr. Crawford's position this may be accepted as an indication of the interpretation which may be adopted by the Food and Drug Administration.

In my opinion, this interpretation is unnecessarily restrictive. In the absence of an interpretative background, the legislative history is the best extrinsic aid to this interpretation. The report of the House Committee on Interstate and Foreign Commerce, in discussing section 406 of the 1938 act, said:

> "Section 406 in subsection (a) provides for a fairer and more effective control of the addition of poisons to food than does the present law. This subsection first prohibits the unnecessary addition of poisons. Where such additions are necessary the establishment of tolerances is authorized, based upon the *practical* necessities for the use of poisonous substances. It is well recognized that an *adequate* fruit and vegetable supply could not be brought to maturity without the use of toxic insecticides and fungicides. But the situation is made extremely complex by the number of poisonous substances used for different localities, and by contaminations which unavoidably occur in many manufacturing processes. The purpose of the subsection is to ensure that the total amount of poisons the consumer receives will not be sufficient to jeopardize health." (Italics added.)[20]

This report indicates that Congress intended that the word "required" as used in section 406 to be synonymous with the word "necessary" or "practical necessities." It would appear that a literal interpretation of this would mean that if it could be shown that some real improvement could be obtained by the use of an insecticide or fungicide in

(*Continued on Page 68*)

17. Section 701(e). The Secretary, on his own initiative, * * * shall hold a public hearing upon a proposal to issue, amend, or repeal any regulation contemplated by any of the following sections of this act: * * * 406(a) (dealing with tolerances of poisonous and deleterious substances) * * *. At the hearing any interested person may be heard in person or by his representative. * * * The Secretary shall base his order only on substantial evidence of record at the hearing and shall set forth as part of the order detailed findings of fact on which the order is based. * * *."

18. Consider, for example, the use of economic poisons on nuts or potatoes where the edible portion of the fruit is not contaminated.

19. "Pesticides and the Food Law," C. W. Crawford, *Food, Drug, Cosmetic Law Quarterly*, Vol. 4, No. 1, March 1949, p. 133, 134.

Sulfur and Life

by

Dr. W. W. Duecker
Texas Gulf Sulphur Co., Inc.
New York

THE feeding of animals and human beings is both a science and an art. Years ago, scientists thought it was simply a problem of providing certain proteins, fats, carbohydrates and minerals. Today we know there is more to it than this. . . . that nutrition must be considered in connection with the great cycle of life made up of the soil, the atmosphere, the plant and the animal. In this cycle, certain simple basic elements are assembled by green plants in constructive processes of food manufacture, disassembled by non-green plants and animals in the destructive processes of food utilization and then returned to the soil. A brief review is presented here to show the part that sulfur plays in this cycle of life.

Sulfur and Soils

BASICALLY, nutrition begins with the soil. It is from the soil that plants, animals and men obtain the dozen or more mineral elements including sulfur that are necessary for their existence. The earth's crust from which soil is formed, according to Clark, contains 0.06% of sulfur in the form of elemental sulfur, sulfides or sulfates. In good mineral soils there seldom is less than 0.03 to 0.04% of sulfur, most of which appears to be contained in organic matter. The major portion of the remainder is probably present as sulfate ion. The presence of these sulfur compounds and sulfur in the soil is said to improve its stucture and physical condition. They help to modify soil reaction. They increase its water-holding capacity. Sulfates, through ion exchange, bring about the liberation of other basic nutrients such as calcium, magnesium, potassium and phosphorous and make them available to plants. Sulfur compounds neutralize alkaline soils and make them fit for cultivation. Sulfur compounds also stimulate the growth of essential soil micro-organisms.

Sulfur and Plants

THE fact that sulfur is indispensable in plant nutrition has been recognized for more than a century If there is insufficient sulfur in the soil, plant growth is slow and stunted. It seems to encourage vigorous plant growth and to increase root development. It promotes nodule formation in legumes. It stimulates seed production. And lastly, when the sulfur supply is low, the leaves of plants are spotted or light green in color, indicating that it may be essential in the formation of chlorophyll.

Agricultural Role Neglected

ALTHOUGH sulfur has long been recognized as being indispensable in plant nutrition, for many years little attention was accorded the importance of the sulfur content of soils and no attempt was made to correlate this with plant growth. This was

Paper presented at 116th meeting, American Chemical Society, Atlantic City, N. J., September 19, 1949.

Below: Dusting sulfur on vegetable crop as an insecticide. (Photo courtesy Texas Gulf Sulphur Co., New York.)

due in part to the lack of proper analytical techniques for determining the sulfur content of plants. It was supposed that all soils contained more than enough sulfur to supply the conceivable needs of the plant. In the middle of the Eighteenth century attention had been called to the fact that applications of gypsum gave increased yields of clover. As a result, the use of gypsum as a fertilizer became quite general in Europe and was introduced to this country by Benjamin Franklin. Interest in sulfur declined, however, when around 1840, researchers in England became convinced that the benefits derived from gypsum were due to the calcium ion and to increases in availability of potassium in the soil due to base exchange.

Not long after this, the manufacture and use of superphosphate fertilizers were initiated. These contained about 10 to 12% of sulfur in the form of calcium sulfate, and were further modified by the addition of potassium sulfate and ammonium sulfate which contains about 23% of sulfur. And, since the widespread use of the new fertilizers brought sulfur to soils which had not received it before, and furnished sufficient sulfur to prevent the deficiency of this element, the study of the relation of sulfur to soil fertility was neglected

Photo above: Liquid sulfur flowing from well to a collecting tank from which it is transferred to storage vats and hardened. Lower photo shows veritable "mountain" of solidified sulfur. When needed, the vat is blasted and the loose material loaded into railroad cars.

Sulfur Lacking in Soils

FOR the next fifty years little was added to the knowledge of the place of sulfur in plant nutrition and its role in the soil. Advances in knowledge had to wait for the development of new tools for research. These became available shortly after the turn of the century when better analytical methods for determining the sulfur content of plants were developed When these improved methods were applied to the sulfur problem, it was discovered that contrary to general opinion all soils did not contain sufficient sulfur to supply the needs of plants. It then became evident that the question of the content of sulfur in soils as related to plant nutrition had to be reappraised. Since that time increasing attention has been accorded sulfur in the soil and its relation to soil fertility and plant nutrition. Now it is generally recognized that soils in general may be more deficient in sulfur than in phosphorous.

Sulfur in Plant Nutrition

THE sulfur content of soil generally is low in comparison with other elements. Plants, however, possess a very evident faculty of assimilating it in much greater quantities than its abundance in the soil might lead one to suppose. Thus the ratio of sulfur in the soil to sulfur in food plants is approximately 1 to 30. It is present in all plants in considerable quantity. It is usually assimilated in the form of sulfate and the sulfur requirements of the various plants vary greatly as judged by their mineral composition. Grain and grasses contain the least. High protein grain such as wheat, generally contains

over 0.3%. Alfalfa and legumes are intermediate. In cabbages, onions and broccoli it reaches a concentration of several percent. It has been estimated that it takes approximately 78 pounds of sulfur to produce a 100-bushel crop of corn.

Although sulfur is absorbed as the sulfate ion, it generally is found in the plant in the form of complex organic sulfur compounds. These may be of various kinds. In the mustard family sulfur is found in the form of sulfur glucosides. In onions and garlic it is present in the form of mercaptans. Based on present knowledge, the most important, however, from the viewpoint of nutrition of humans and animals, are the sulfur-containing proteins synthesized by plants and the substances from which vitamins are formed.

Role in Animal Nutrition

IN the nutrition of humans and animals, sulfur generally is not considered in connection with the mineral elements. This is because sulfur plays its role in the body in the form of complex organic compounds rather than in the form of inorganic substances. Moreover, practically all of the sulfur obtained by humans and animals is obtained in food, chiefly in the form of protein and not as inorganic compounds. The fact that sulfur somehow or other was related to human nutrition and well-being, however, has been long recognized. Grandmothers of a generation or so ago may not have known why, but they did recognize the fact that a dose of sulfur and molasses in the spring had a beneficial effect on children.

Sulfur is very necessary for the maintenance of human health and well-being. If it were not for the complex organic sulfur compounds which animals obtain from plants, all higher animals existing today would eventually perish. These sulfur compounds are of various kinds. Sulfur-containing protein is particularly important. Protein is the essential constituent of all living cells. Nothing else can take its place in building new tissues in the body or replacing losses. Protein, in turn, as far as human nutrition is concerned, is synthesized from ten basic amino acids. One of these ten is a sulfur-containing amino acid called methionine. If methionine is withdrawn from the diet, growth ceases or is generally retarded. There are other sulfur-containing amino acids and one of these, cystine, constitutes a large part of the skin, hair and nails, but none is as important as methionine.

Sulfur-containing protein material or certain amino acid residues are also essential parts of many of the enzymes and hormones which regulate complex biological reactions. Another sulfur-containing compound is vitamin B_1 or thiamin. This is essential for the well-being of every living cell and for the normal growth of all species of animals, of yeasts and molds and of higher plants. Many of these compounds are obtained only from plants, and, since the plant obtains practically all of its sulfur needs from the soil, the question of soil fertility in terms of sulfur becomes exceedingly important. In connection with the well-being of humans and animals, mention should also be made of a new group of sulfur compounds, the sulfa drugs and penicillin, which have become increasingly important in the control of disease.

Sulfur Balance in Soil

NORMALLY in the cycle of life it is expected that all plant and animal residues will be returned to the land. The same basic elements therefore would be used over and over again. But unfortunately, the sulfur cycle is sometimes thrown out of balance with the result that often more sulfur is removed from the soil than is added. This question of an adequate supply of sulfur in the soil

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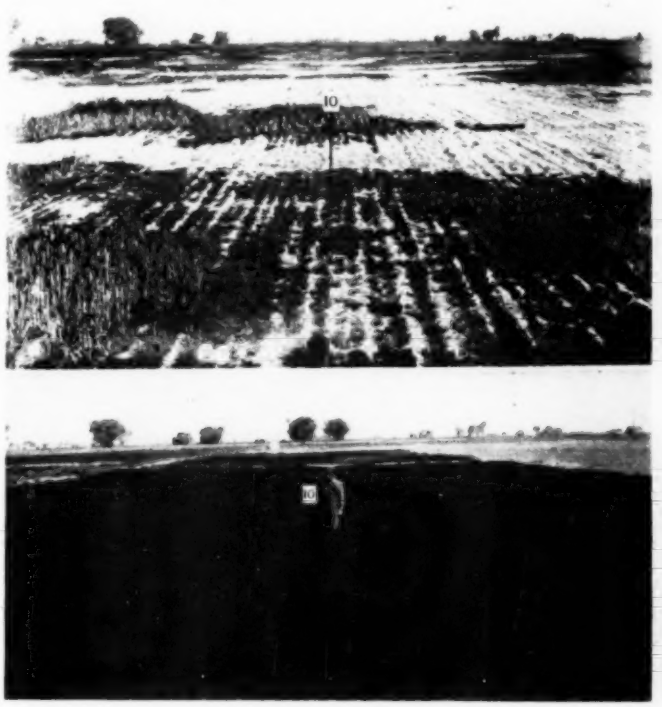

Photos at right: graphic "before and after" shots show field of alfalfa without added sulfur (above) and same field, near Fresno, Calif., after application of sulfur. (Photos through courtesy of Texas Gulf Sulphur Co., New York.)

National Fertilizer Association

holds twenty-third annual Southern meeting in Atlanta . . . speakers include banker, publicists, soil conservationists, scientists & representative from Britain . . . heavy registration

PRESENTING a program of international scope, the National Fertilizer Association held its twenty-third annual southern convention at the Atlantic Biltmore Hotel, Atlanta, Ga., November 14-16. The group, numbering nearly 500, heard talks on soil fertility trends; ECA assistance in Europe; fertilizer problems in Britain; the attitude of bankers toward agricultural loans; and a panel on publicizing the soil improvement program. The annual banquet was held Tuesday evening, with a near record attendance. Vice-chairman J. E. Totman presided.

John L. Liles, Jr., agricultural economist of the Federal Reserve Bank of Atlanta, told the group that farmers in the future are likely to be scrutinized much more carefully before loans are extended. Far more details about the farmer's plans for a number of years ahead will be requested by bankers, he said, with three considerations taking precedence over others. These include the man himself, the land involved, and the future plan as outlined by the applicant. Mr. Liles declared that bankers will have to exercise closer supervision over their farm customers to see that the land is being wisely managed, and pointed out that more and more banks will maintain field men or farm service departments to this end. Finally, he said, the banker will pay greater attention to the farmer's "know how" and his ability as a business man.

As readjustments come as a result of acreage cuts and other factors, farmers will require an increasing amount of capital for machines, for seeding, and for fertilization, he asserted. At the same time, some farmers will be faced with decreasing ability to obtain loans because of lower net incomes. These are problems which face the farmer and banker alike, he pointed out.

Ray L. King, Valdosta, Ga., chairman of the NFA Board of Directors, predicted that one and a half million tons more of mixed fertilizer than was used last year, will be available to American farmers in 1950. In his talk, he reviewed FAO estimates which indicate a lessening pressure for export nitrogen, and pointed out that this 1½ million tons of mixed fertilizer and an additional 1,000,000 tons of top-dressing nitrogen will be used in the U.S. He added that present indications fail to portend any drop in domestic consumption of fertilizer.

Trends of soil fertility in the U.S. were discussed thoroughly by Dr. F. W. Parker, Assistant Chief, Bureau of Plant Industry, Soils and Agricultural Engineering, U.S.D.A., Beltsville, Md. Dr. Parker showed numerous slides and diagrams to illustrate the condition of various soils in different parts of the country, stating that the plant nutrients removed from the soil by harvested

IN THE PHOTOS: Top row, L to R, first picture: John F. Gruber, St. Regis Paper Co., Baltimore, Md.; Mrs. Burton A. Ford; John Watt, Armour & Co., Atlanta; Burton A. Ford, St. Regis Paper Co., Allentown, Pa. Second photo: J. Rucker McCarty, International Minerals & Chemical Corp., Atlanta; C. Dale Hoover, State College, Mississippi; and Dr. K. D. Jacob, U.S. Department of Agriculture, Beltsville, Md. Third photo: Dr. H. B. Mann, American Potash Institute, Washington, D. C.; C. D. Shallenberger, Shreveport Fertilizer Works, Shreveport, La.; and John F. Wood, Texas Gulf Sulphur Co., Houston, Texas.

Second row, first photo: Robert H. Engle, National Fertilizer Association, Washington, D. C., and Borden S. Chronister, The Barrett Division, Hopewell, Va. Second photo: Fertilizer patriarch, C. H. MacDowell, Winter Park, Florida, who has been attending industry meetings for several decades. Third picture: Maurice H. Lockwood, International Minerals & Chemical Corp., Chicago, former NFA president; E. O. Kintzing, Swift & Co., Chicago, Ill.; John Higson Smith, London, England; and C. T. Prindeville, (head turned away from camera), Swift & Co., Chicago.

Third row from top: A. W. Higgens, Presque Isle, Maine; C. R. Martin, Miami Fertilizer Co., Xenia, Ohio; and Graham Campbell, Chamberlin & Barclay, Cranbury, N. J. Second photo: J. E. Totman, Summers Fertilizer Co., Baltimore, Md., NFA vice-chairman; and Dr. Russell Coleman, NFA president. Third photo: Burton A. Ford; Lee Ashcraft, Ashcraft Wilkinson Co., Atlanta, sponsor of the barbecue where picture was taken; and Mr. Gruber.

Bottom row: William E. Evans, Jr., and Daniel B. Curll, Jr., Commercial Solvents Corp., New York. Second photo: Harold R. Dinges, Spencer Chemical Co., Kansas City, Mo.; L. W. Berry; and W. L. Dixon, Jr., Best Fertilizer Co., Oakland, Calif. Last photo shows the ladies who took care of registering nearly 500, and who answered innumerable questions: Mrs. Louise F. Mertz, NFA, Washington, D.C.; Ann Norton, Swift & Co., Atlanta; and Elsie Nelson, International Minerals & Chemical Corp., Atlanta.

crops greatly exceed that replaced on an over-all average. The return is greatest in the eastern and southern states, he reported, with many states actually returning more plant food than was removed.

Major changes are taking place in soil fertility, such as in the corn belt and Great Plains states where nitrogen and organic matter content has declined 25 to 50 percent. The decline is continuing, he said, but on the other hand, the mineral status of many soils in the south and east has been increased by fertilization and liming. He concluded by stating that good soil management and fertility improved by judicious use of fertilizer materials, will pay off. He cited figures to indicate that current crop yields are 35 percent greater than the long-time prewar average. "This improvement has been concurrent with a great expansion in the use of fertilizers and lime. . . .soil conservation and other improved practices," he observed.

A dramatic presentation of the case for wise use of the land and for increased application of fertilizer was given by W. R. Thompson, associate leader, Extension Agronomy, Mississippi State College. Stating that soil erosion is the South's worst problem, Mr. Thompson declared that good pastures will remedy not only this situation but also will make the soil rich, produce nutritious feed and bring profits to the farmer. "You cannot wear out soil with livestock," said Mr. Thompson, who then offered four points for a satisfactory pasture program: A well-developed plan, adequate fertilization, good seeding and proper management, including proper insect control methods. An omission of any one of these points will lead to certain failure, he declared.

The fertilizer salesman is truly a service man, for without fertilizer, the farmer of today would be hopelessly lost, he asserted.

Problems faced by British fertilizer producers were analyzed by John Higson Smith, leader of the United Kingdom fertilizer manufacturing team which was touring the U.S. at that time. He reported that despite considerable damage to fertilizer plants during the war, lack of help, and other hindering factors, production of fertilizer in England has been more than doubled in the decade from 1939-49. Fertilizer consumption during the same period has also doubled, and the educational program is making definite headway through the knowledge thus gained, he said. The damp climate of Britain makes storage in bags difficult, he said, which was one of the factors prompting the present program of granulation of fertilizers. Through this means, a completely conditioned fertilizer may be produced without curing, he said, and added that the granulated product also provides an easily-handled material for the farmer. Approximately 70 percent of Britain's total sales of compound fertilizers is in granulated form, he said.

W. F. Watkins, chief, Fertilizer, Seeds and Pesticides Branch, Food and Agriculture Division, Economic Cooperation Adm., Washington, D.C., told the NFA group that although food production in many European countries is from 50 to 75 percent higher than it was in the 70's, there is "still a lot of room for improvement." He stated that fertilizer application has had a great deal to do with the progress made thus far, and that European farmers are very much aware of the worth of fertilizers. Mr. Watkins told of the development of hybrid corn, and of not only fertilization, but of other scientific methods of crop production. The use of fertilizers and weed control go hand-in-hand with the hybrid corn program, he said.

A panel led by Channing Cope, author-farmer and radio columnist, discussed means of publicizing the story of soil improvement. Other members of the panel were: James M. Eleazer, information specialist, Clemson Agricultural College, Clemson, S.C.; L. R. Neel, editor, *Southern Agriculturist*, Nashville, Tenn.; and Alexander Nunn, managing editor, *The Progressive Farmer*, Birmingham, Alabama.

Dr. Neel commented that the

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Officers and members of the Board of Directors of The National Fertilizer Association at the southern convention in Atlanta. Seated: E. S. Russell, South Deerfield, Mass.; J. H. Epting, Lewisville, S. C.; Walter E. Meeker, Boston, Mass.; Robert S. Cope, Savannah, Ga.; J. E. Tillman, vice chairman, Baltimore, Md.; Ray L. King, chairman, Valdosta, Ga.; Russell Coleman, president; D. S. Murph, secretary-treasurer; C. D. Smallenberger, Shreveport, La.; James W. Dean, Knoxville, Tenn.; and John A. Mulder, Louisville, Ky. Standing: A. A. Schultz, Reading, Pa.; C. R. Martin, Dayton, Ohio; H. A. Parker, Sylacauga, Ala.; C. T. Prindeville, Chicago, Ill.; B. B. Fall, Portland, Conn.; J. L. Nichols, Sumter, S. C.; E. A. Geoghegan, New Orleans, La.; Ralph E. Fraser, Bangor, Maine; M. G. Field, Hattiesburg, Miss.; Elbert N. Carvel, Laurel, Del.; A. W. Weaver, Norfolk, Va.; J. H. Owens, Roanoke, Ala.; L. D. Hand, Pelham, Ga.; Moultrie J. Clement, Pensacola, Fla.; L. Graham Campbell, Cranbury, N. J.; John E. Powell, Columbus, Ohio; F. N. Bridgers, Wilson, N. C.; and H. B. Fultz, Miami, Fla.

—Photo Courtesy National Fertilizer Association

Am. Phytopathological Society Program Covers Newly Developed FUNGICIDES

FEATURING a fungicide colloquium, a symposium on the performance of new fungicidal sprays and dusts, and sessions on fungicide toxicology and methods of application, the American Phytopathological Society will meet December 28-30 at the Martinique Hotel, New York City, in its forty-first annual meeting. The meeting will be in connection with the annual meeting of the American Association for the Advancement of Science.

Wednesday morning's session will comprise a business meeting under the chairmanship of Dr. W. D. Valleau, Lexington, Ky., APS president; and a meeting of the Northeastern Division of APS, with the division president, D. H. Palmiter, N. Y. State Agri Experiment Station, Geneva, N. Y., in charge.

The afternoon session will be divided into four sections, as follows: Stone Fruit and Citrus Virus Diseases, Donald Cation, chairman; Stone Fruit Virus Disease Conference, G. W. Keitt, chairman; Vegetable and Small Fruit Crop Diseases, S. H. Younkin and M. B. Linn, chairmen; and a conference of extension plant pathologists, with O. C. Boyd, chairman.

Concurrent sessions are also scheduled for the evening meeting beginning at 8. These include a symposium on the teaching of Plant Pathology, under the chairmanship of G. F. Weber; and the Fungicide Colloquium, with F. L. Howard in charge. This portion of the program is expected to attract a considerable amount of attention from industry, since its speakers and their topics will bear directly upon problems facing manufacturers of fungicidal products.

Dr. James G. Horsfall, Connecticut Agricultural Experiment Station, New Haven, will discuss emergent European fungicides in a report on the Second International Institute of Crop Protection held in England during the past summer. Lea S. Hitchner, executive secretary of the National Agricultural Chemicals Association, Washington, D. C., will talk on Industry Problems; and chairman Howard, Rhode Island State College, Kingston, will present the 1949 compilation of plant and animal toxicity of fungicides in use.

Federal registration of fungicides will be the topic of a talk by Earnest A. Walker, U. S. Department of Agriculture, Washington, D. C., followed by a discussion of residue tolerances by T. B. Bellis, U. S. Food and Drug Administration, Washington, D. C. Continuing the theme of toxicology of various fungicidal materials, a forum on the subject will discuss various problems in this connection. Robert A. Keyhoe, Kettering Laboratories, Cincinnati, Ohio, will be in charge of this forum on fungicide toxicology.

The final portion of the colloquium will see the introduction of newly developed fungicidal chemicals and adjuvants by accredited technical representatives of the industry. Products available for testing, in 1950, and others being placed on the market for the first time in 1950, improved products, and seed treating chemicals will be included in the categories. Chairman of the colloquium will be Dr. Howard. Industry representatives are urged to have mimeographed copies of their data sheets for distribution among the attendants.

Concurrent sessions are again scheduled for Thursday morning. These will include one section on tobacco and potato diseases, with G. B. Lucas, chairman; diseases of wheat, oats and corn, with George Fischer chairman; and a symposium on the performance of new fungicidal sprays and dusts in cooperative regional experiments conducted in 1949. J. D. Wilson will be chairman of this session. Tests on apples will be reported by J. M. Hamilton, N. Y. Agricultural Experiment Station, Geneva; on carrots and celery, by A. G. Newhall, Cornell University; on cucurbits, W. M. Epps, S. Carolina Agricultural Experiment Station, Charleston; on snapdragon, by A. W. Dimock, Cornell University; and on gladiolus, by J. L. Forsberg, Illinois Natural History Survey, Urbana, Ill. Tests on potatoes, tomatoes and turfs will be reported, respectively, by W. F. Buchholtz, Iowa State College, Ames; M. B. Linn, University of Illinois, Urbana; and Dr. Howard.

A fourth session during the morning period, will be under the chairmanship of H. P. Barss, on the outlook for cooperative regional projects in plant pathology under the Research and Marketing Act.

Concurrent sessions are to continue into Thursday afternoon, with three sessions. One, covering fruit crop diseases, is under the chairmanship of R. H. Daines; the second, discussing forage and miscellaneous field crop diseases, will be headed by L. Henson; and the third, diseases of ornamentals, will be under the chairmanship of W. D. McClelland. The annual Phytopath dinner will be held Thursday evening in the ballroom of the McAlpin hotel, a half block from the Martinique.

The final day of the meeting will see two concurrent sessions in the morning, following a business meeting at 9, with APS president, W. D. Valleau, in charge. The later sessions will hear papers on diseases of forest and shade trees, with M. A. McKenzie, chairman; and more discussion of diseases of flax, safflower, rice and sugar cane, with Thor Kommedahl, as chairman.

A joint session with the Mycological Society of America will be held Friday afternoon, with F. D. Kern as chairman; and another session on fungicides and methods of application will be held at the same time, with D. H. Palmiter as chairman. Among the papers to be presented here, will be one by J. D. Wil-

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Eastern Branch of AAEE Reports Results of Tests on

Agricultural Insecticides

THE 21st annual meeting of the Eastern Branch of the American Association of Economic Entomologists, a two-day session held November 21 and 22 at the Lord Baltimore Hotel, Baltimore, Md., closed with the election of Edwin Gould of the West Virginia Experiment Station, Kerneysville, W. Va., as chairman for the coming year, succeeding Frank C. Nelson of Esso Marketing Div., Standard Oil Co., Bayway, N. J. F. H. Lathrop of the Maine Exper. Station was elected vice-chairman. B. F. Driggers of New Jersey continues as secretary-treasurer. (See Pg. 62 for photos of new officers.)

Local arrangements in Baltimore were in the hands of a committee headed by Dr. Amos Badertscher of McCormick & Co. Next year's meeting will be held in Philadelphia.

Dr. A. M. Boyce, President of the American Association of Economic Entomologists made a special trip from Riverside, California to be on hand at the Eastern Branch meeting. He extended a special invitation to members of the Eastern Branch to attend the National meeting in Tampa, Florida, December 13-16. He also spoke briefly, emphasizing the need of broadening research programs in agricultural entomology to correlate and integrate research on the effect of insecticides on plants. He referred to the occasional complications resulting from insecticide use such as disturbing the biological balance of beneficial insects, emphasizing that spray programs must be adjusted carefully so that the biological balance will not be upset.

The repeated cases in which various insect pests seem to be developing resistance to particular insecticides pose a serious problem to the economic entomologist, Dr. Boyce warned. Repeated use of DDT on citrus, for instance, has resulted in citrus thrips developing a resistance to this particular insecticide.

Reports from California also indicate that BHC-resistant strains of flies have been encountered, while from Florida come reports of mosquitos developing resistance to DDT.

Neely Turner of the Connecticut Station at New Haven read the opening paper "Removal of Benzene hexachloride from Treated Soil." He observed that BHC used in soil at the rate of 2.5 pounds per acre to control wireworms continues to cause off-flavor in potatoes. It was found possible to remove the off-flavor almost completely with the use of activated charcoal at the rate of one ton per acre of BHC-treated soil. Hydrated lime at five pounds per acre was found to be almost as effective. Ferric chloride and alcoholic potash were not effective. Liquid lime sulphur at the rate of 12½ or 25 pounds per acre proved to be partially effective. However, it imparted an off flavor itself. At the rates necessary for use it is apparent that neither activated charcoal nor hydrated lime is a practical treatment. Their effectiveness, however, does indicate that it should be possible to develop practical corrective treatments, the speaker indicated.

W. A. Connell, University of Delaware, Newark, Del., reported on "DDT and Methoxychlor for Control of the Strawberry Weevil." Control by use of arsenate of lead, formerly the standard treatment, has been relatively unsatisfactory in recent years. DDT, 3%, and methoxychlor, 5%, gave much better control, he reported, with only about one-third the bud damage as compared with arsenate.

Methoxychlor also shows definite promise for the control of elm scolytus, Stanley W. Bromley of Stamford, Conn., reported in his paper, "Spray Tests for Control of Elm Scolytus."

Red Mite Control

A GROUP of papers reported on recent developments in experimental work on mite control. F. H. Lathrop of Orono, Maine, in his paper, "The Control of European Red Mite on Apples," indicated that a dimtro capryl phenyl crotonate preparation ("Arathane" by Rohm & Haas) appears promising for control of this pest. Frequent post-bloom applications of this insecticide-fungicide combination were recommended to control red mites and apple scab.

In another paper dealing with use of dormant and delayed dormant sprays to control European red mite on apples, Dean Asquith of Pennsylvania Fruit Research Laboratories, Arendstville, Pa., reported that treatment with 1.95% of a superior oil is at least equal to 3.32% of a regular oil as an ovicidal spray for overwintering eggs of European red mites when applied in a split dormant-delayed dormant schedule.

"Orchard Mite Control Experiments in Western New York" were reported by P. J. Chapman of Geneva, N. Y. Under New York conditions he recommended parathion or TEPP for mite control. At least one pound of parathion is needed, per 100 gals. for satisfactory residual con-

trol, he reported. Using TEPP, two treatments were found necessary for satisfactory residual control.

Philip Garman of the New Haven, Conn., Station, in his paper "Resistance of Red Spiders to Parathion" emphasized that more than one miticide must be used to obtain effective control. Resistance develops to a single product.

Describing supplements in DDT sprays to control Grape Berry Moth, James A. Cox, Pennsylvania Agri. Exp. Station, said that spray mixtures containing DDT and a miscible oil gave better control, but also left more DDT residue on harvested fruit. DDT without a supplement left little residue, but gave poor control. Four applications of DDT alone were inferior to three of DDT and miscible oil, he reported. Three applications of DDT and an oil spreader-sticker gave excellent control in heavily infested vineyards.

Parathion Discussed

SEVERAL papers devoted to parathion gave particular attention to the subject of possible plant injury. Fred I. Edwards, Jr., of South Laboratories, Agr. Research Center, Beltsville, Md., reported on "Plant Injury from Parathion, Its Impurities and Related Compounds." At 0.5 lbs. per 100 gals., parathion causes death to crassula, he reported, but no damage to tomatoes. Unreacted p-nitrophenol is the principal impurity in parathion which could cause damage to tomatoes, he indicated.

E. H. Glass of the New York State Agricultural Experiment Station at Geneva, N. Y., reported on "Parathion Injury to Apple Foliage and Fruit." Reports of such damage were received during the 1948 season, with McIntosh, Cortland and related varieties susceptible to such damage, while other varieties did not suffer. Necrosis of the leaf was reported quite commonly on these susceptible varieties following the pink and calyx applications. From applications 14 days after calyx no such damage was reported. Tests indicated that it was the actual parathion itself that caused the damage, not impurities. To reduce the extent of the injury, additives were found helpful, such as activated bentonite, charcoal, etc.

The paper "Longevity of Parathion, DDT and TDE Residues on Field and Vegetable Crops" by J. M. Ginsburg, R. S. Filmer, J. P. Reed and R. Sweet of the New Jersey Agricultural Experiment Station was read by Mr. Ginsburg. Residues were analyzed on such crops as alfalfa, corn, onions, pea vines, scallions and turnips. Practically no parathion residues were recovered on crops harvested twelve days or later after the final application of either 0.5% or 1% dusts or sprays containing 0.125 to 0.25 pounds per acre. Pea vines sprayed with 0.5 lbs. parathion per acre showed 0.1 ppm at harvest nineteen days after spraying.

Corn dusted five times with 3% DDT and harvested thirteen days after the last application contained 13.1 ppm of DDT. Corn dusted five times with 5% TDE analyzed 27.1 ppm. It was aparent that in the absence of sufficient rainfall comparatively large quantities of DDT and TDE may be retained by corn plants at harvest.

With one exception none of the three toxicants were found to be translocated to any appreciable extent in plant tissues in dust, spray or soil treatments. The one exception was in corn kernels from plants dusted five times with 1% parathion. The amount of toxicant found however, was negligible, only about 0.03 ppm.

B. F. Driggers of the N. J. Agricultural Experiment Station, New Brunswick, N. J., reported that parathion gave excellent control of plum curculio on peaches. It also controlled oriental fruit moth. Benzene hexachloride also showed up well in the curculio work.

M. J. Sloan of the Entomology Department of Cornell University, in his report on "Preliminary Trials in Onion Thrips Control" indicated that some of the newer compounds such as =118, 497 and 104 seem to show promise on onion thrips. In addition to immediate kill, they offer residual effects.

Another group of papers emphasized the synergistic effects of piperonyl cyclonene and piperonyl butoxide on pyrethrum and rotenone. In his paper, "Piperonyl Cyclonene, Pyrethrins, and Rotenone Tested in Dusts Against the Mexican Bean Beetle," Donald H. Moore, U.S. Industrial Chemicals, Inc., Baltimore, Md., reported that a dust containing 0.5 per cent piperonyl cyclonene, 0.05 per cent pyrethrins, and 0.25 per cent rotenone, designated commercially as "CPR" dust, was found to be more effective than 0.75 per cent rotenone against larvae of the Mexican bean beetle, and only slightly less effective than rotenone against laboratory-reared adult beetles. The dust was at least equal in effectiveness to 0.75 per cent rotenone against adult field beetles.

Surface deposits were discussed in the paper "Piperonyl Butoxide and Pyrethrins Tested as Surface Treatments Against Insects Affecting Stored Food Products" by E. J. Incho and H. H. Incho, U. S. Industrial Chemicals, Inc., Baltimore, Md. Laboratory tests indicated that surface deposits of 50 mg. of piperonyl butoxide and five mg. of pyrethrins per square foot were effective against rice weevils, flour beetles, Angoumois grain moth, the dried fruit beetle, and larvae and adults of the Cadelle. The pyrethrin content in the above mixture might be reduced to about 3.5 mg. when used on plywood panels against the flour beetles and the Angoumois grain moths.

Labortory tests against the rice weevil, *Sitophilus oryza L.* were discussed in the paper, "Piperonyl Butoxide and Pyrethrins Tested in Dusts Against Rice Weevils," by Carl N. Watts and F. D. Berlin, U. S. Industrial Chemicals, Inc., Baltimore, Md. The tests demonstrated the marked synergism between piperonyl butoxide and pyrethrins against the rice weevil. Four different ratios of the two compounds gave from good to complete control over a thirty-day test period, while the compounds alone, gave only moderate control.

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Conn. Pest Controlled

A NEW golf course pest, an oriental earth worm, which has been giving considerable concern around Connecticut was described by John C. Schread of the Connecticut station. After trying various insecticides for control, the recommended treatment was chlordane, one quart of emulsion to 50 gallons of water per 1,000 sq. ft., or "Octalene" (25%), three pints of emulsion to 50 gals. of water per 1,000 sq. ft.

Reporting on "Some Experiments with Liquified Gas Aerosols for the Home Gardener," L. J. Ditman of College Park, Md., outlined several essentials before success may be attained in this direction. A dependable dispenser that will carry sufficient insecticide to do an economical and dependable control job must be developed. A toxic must be selected which will not harm common garden crops if an overdosage is applied, he warned. The answer, he believes, may be found in the development of combinations of high gamma odorless benzene hexachloride with either rotenone or pyrethrum.

A paper by J. P. Reed and R. S. Filmer of the New Jersey Station indicated promise for use of piperonyl cyclonene and n-propyl isome for activation of ryania dusts. Dusts containing only 15% ryania plus one-half of one percent piperonyl cyclonene were found to be substantially as effective as the conventional 40% ryania dusts, offering hope that the cost of ryania dusts may be brought down sufficiently low to encourage their use. Equally effective results were reported with use of n-propyl isome as synergist.

Pesticide Labeling Under New Act Discussed by Dr. C. C. McDonnell

A discussion of labeling for pesticides under the provisions of the Federal Insecticide, Fungicide and Rodenticide Act is presented in the December issue of *Soap and Sanitary Chemicals*, by Dr. C. C. McDonnell. The author reviews the provisions for proper labels, reminding that their function is to provide "adequate protection of the public," and that they must not be misbranded.

Since the requirements are new for many of the pesticides now in the market and no recognized standard poison labeling for them has ever been adopted, the requirements of the U. S. Department of Agriculture have been in the formulative stage since the Act became effective, and have been subject to changes from time to time, he points out.

Although a considerable amount of liberality has been shown, manufacturers have been inconvenienced by the uncertainties involved. However, in many cases, the warning and caution labeling used by manufacturers were found to exceed the minimum requirements of the Act. This indicates a desire on the part of the makers of insecticides, not only fully to comply with the law, but to protect the buyer and user as well.

However, the Department has now adopted acceptable warning and caution statements applicable to most of the present formulations, and also antidotal statements for products requiring such under the Act. These have been published in the *Federal Register*. This is not only of great benefit to manufacturers, but standardizes the requirements and leads to greater protection of the public, Dr. McDonnell points out.

Commenting on registration "under protest," the author states that criticism has been directed toward it, and suggestions have been made that the Act should provide for premarketing approval of new chemical products to be used in spraying fruits, vegetables, etc.

The administrator of the Act is authorized to call for the formula, the complete labeling and a "full description of the tests made and the results thereof upon which the claims are based," before registering a new product.

This authority applies not only to newer preparations, but to those which have been on the market for any length of time. Furthermore, registration of itself is not a defense for the commission of any offense prohibited by the Act, and if a person is found guilty of an offense in connection with a product which had been registered under protest, the Act provides for double the normal fine, and, in addition, a prison sentence up to one year may be imposed. Of about 25,000 products registered, according to the U.S.D.A., only four were registered under protest and only one of these was for use on food crops.

Use of pesticides in the production of food crops is practically universal, and the need for employing every practical safe-guard is well understood. But precautionary labeling can be effective only if the user heeds the warnings. Despite the efforts of manufacturers to protect users, much of the ultimate responsibility lies with parents of small children and others, to avoid careless use and possible mistaking a toxic powder for flour or other foodstuff. The handler and user of economic poisons should read the warning and caution labeling carefully and be guided by it, Dr. McDonnell concludes.

•

Texas Plans Develop

Although the program for the meeting of the Texas Entomological Society was not completed at press time, it was indicated by the group's secretary, L. F. Curl, that there will be numerous reports covering recent investigations on the control of cotton insects. The meeting, to be held at the Rice Hotel, Houston, January 19 and 20, will also present papers on control of insects affecting cattle and other livestock. The latter experiments are largely conducted at the Kerrville Laboratory of the Bureau of Entomology and Plant Quarantine, U.S.D.A.

Mr. Curl states that there will, in addition, be a number of papers on insects affecting vegetables, placing particular emphasis on the southern part of the state. A complete program is expected to be presented in the January issue of *Agricultural Chemicals*.

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Quinn Elected at 26th Annual Convention of CALIF. FERTILIZER ASSN.

By Elmer S. Nelson
Executive Secretary,
Calif. Fertilizer Association

THE 26th annual convention of the California Fertilizer Association was held November 7-9 at the Palace Hotel, San Francisco, with a record attendance of 280. The group elected as president, James M. Quinn of the California Sun Fertilizer Co., Los Angeles; vice-president, Lowell W. Berry, Best Fertilizers, Co., Oakland; secretary Paul Pauly, Pacific Guano Co., Los Angeles; and treasurer, Grover C. Dunford, Inland Fertilizer Co., Los Angeles. Elmer S. Nelson remains as executive secretary and manager of the Association. Other directors of the CFA are Ralph J. Crum, Pacific Guano Company, Berkeley; Ned Lewis, Wilbur-Ellis Company; Wallace Macfarlane, Pacific Guano Company, Los Angeles; M. C. McNeil, Swift & Company, Hayward; Earl R. Mog, Growers Fertilizer Company, Stockton; Charles Monoogian, Downey Fertilizer Company; and Byron Reynolds, Bandini Fertilizer Company, Los Angeles.

The opening business session of the meeting was conducted by the State Bureau of Chemistry under Allen B. Lemmon, chief. A report of the year was presented by Mr. Lemmon and Robert A. Rollins, assistant chief. J. L. Avery, district inspector from San Francisco, and DeWitt Bishop, Sacramento, reported on activities in their respective areas. A paper on liquid fertilizers, covering the distributing of liquids and practices and uses of such fertilizers, was presented by G. D. Bender, Los Angeles district inspector.

Dr. F. W. Parker, Assistant Chief of the U.S.D.A. Bureau of Plant Industry, Soils, and Agricultural Engineering, Washington, D.C., discussed "Changes in the Fertility of Our Soils," observing that "Recent data indicate the removal of nitrogen and potash by harvested crops exceeds the quantity returned in fertilizers and farm manures by 80 and 55 percent, respectively. The return is greatest in the eastern and southern states," he said, and continued by stating that the nitrogen and organic matter content of many soils of the Corn Belt and Great Plains has declined 25 to 50 percent and is continuing to decline. On the other hand, he said, the mineral status of many soils in the South and East has been improved by fertilizers and lime.

A panel composed of Earle Coke, director, State Agricultural Extension Service, University of California; M. E. McCollam, American Potash Institute; Beverly Jones, Sunland Industries, Fresno, Calif.; and Ned Lewis, Wilbur-Ellis Co., Los Angeles, discussed "Industry Problems," with Lowell Berry, Best Fertilizers Co., as moderator.

Mr. Jones emphasized the importance of good public relations to the fertilizer industry. Dr. McCollam stressed the need for a close-working relationship with the University of California, both with the members of the Extension Service and Experiment Station. He pointed out that "The more we accept the findings of research the more will be the benefit to the whole industry."

Mr. Lewis reminded his hearers that a milestone has been reached when the fertilizer industry and the University Extension Service are willing to sit down together and study problems that must be considered. There is the problem of the cost of doing business because of the large number of grades of fertilizers to be produced; problems of educating salesmen to use the services the state offers, and that of making the Association be of further benefit to the farmer. These problems must be solved if the industry is to progress, he concluded.

Mr. Coke stated that the objective of the fertilizer industry is

(Turn to Page 66-B)

CFA Official family: seated (L to R), Earl R. Mog, director and retiring president; Miss Dorthea M. Beidle, office secretary; Paul Pauly, re-elected secretary. Standing: Byron Reynolds and Ralph Crum, directors; J. M. Quinn, new CFA president; Charles Monoogian, director; Lowell W. Berry, new vice-president; Dr. Wallace Macfarlane and New Lewis, directors; and Elmer S. Nelson, executive secretary and manager. Absent when photo was taken, were G. C. Dunford, re-elected treasurer; and M. C. McNeil, Swift & Co., director.

—Photo Courtesy Calif. Fertilizer Ass'n.

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USDA Interprets and Lists Minimun

Pesticide Labeling Requirements

AN interpretation of the provision in the Federal Insecticide, Fungicide and Rodenticide Act covering minimum warning or caution statements and antidotes on labels of products containing one or more of a list of 71 active ingredients was issued Nov. 18 by the U.S. Department of Agriculture. The chemicals listed in the interpretation, which is designated as "Interpretation No. 18," are classified into one of the following four groups:

1.) High toxic products which require the word "poison," the skull and cross-bones and an antidote statement including directions to call a physician, and a warning statement.

2.) Those products which fall in a class immediately below the highly toxic and in general include formulations having a toxicity down to one-tenth of the highly toxic class. The label of this class does not require the skull and cross-bones but does require a warning statement.

3.) This group embraces products having hazards below class 2 but to a degree which still requires some caution and usually includes toxicities down to about one-tenth of those in class 2. This class requires a caution statement.

4.) The fourth class is comparatively free from danger.

In the suggested caution statements listed below, the exact wording is not compulsory, but the substance of all such statements is required, unless under special conditions of handling or use, it is unnecessary. The notation "H.P." indicates that the warning is required only on packages commonly stored or used in the household where there is greater danger of accidents involving children or pets. The notation "A Poison" always refers to the skull and cross-bones and the word poison in red. The first hazard caution prescribed in each case is based on the flash point of the chemical named. The minimum labeling needed to bring specified formulations into compliance with the warning, caution and antidote requirements of the Act is as follows:

(3) Alphanaphthylthiourea (ANTU) —30 per cent and above.

Antidote: Give a tablespoon of salt in a glass of warm water and repeat until vomit fluid is clear. Have victim lie down and keep quiet. Call a Physician Immediately!

Warning: Keep dogs, cats, hogs and chickens away from baited areas.

Below 30 per cent.

Warning: Keep away from children and domestic animals. Avoid contamination of feed and foodstuffs.

(5) Arsenic compounds.

Inorganic insoluble including calcium arsenate, lead arsenate, magnesium arsenate, paris green. Inorganic soluble including arsenous oxide, sodium arsenate, sodium arsenite.

Inorganic insoluble 50 percent and above. Inorganic soluble 5 percent and above.

X Poison

Antidote: Give a tablespoonful of salt in a glass of warm water and repeat until vomit fluid is clear. Then give two tablespoontuls of epsom salt or milk of magnesia in water, and plenty of milk and water. Have victim lie down and keep quiet. Call a Physician Immediately!

Warning: Do not leave in eyes, on skin or on clothing. Wash thoroughly. Do not breathe dust or spray mist.

Inorganic insoluble 10 percent to 50 percent. Inorganic soluble 1 percent to 5 percent.

Warning: May Be Fatal If Swallowed! Do not get in eyes or on skin. Wash thoroughly. Do not contaminate feed and food stuffs. Keep out of reach of children and domestic animals.

Inorganic insoluble below 10 percent. Inorganic soluble below 1 percent.

Caution: Avoid prolonged breathing of dust or spray mist. Avoid contamination of feed and foodstuffs. Keep away from children and domestic animals.

Formulation for weed killing.

Add special warning "Keep livestock off treated areas."

(9) Benzene hexachloride (hexachlorocyclohexane, "666."

BHC and dry formulations 25 per cent and above.

Warning: Harmful Vapor and Dust! May be Absorbed Through Skin! May Produce Irritation of Skin and Eyes! Avoid prolonged breathing of vapor, dust or spray mist. Do not leave in eyes or on skin. Wash thoroughly. Avoid contamination of feed and foodstuffs.

BHC and dry formulations below 25 per cent.

Caution: Avoid prolonged breathing of vapor, dust or spray mist. Do not leave in eyes or on skin. Wash thoroughly. Avoid contamination of feed and foodstuffs.

Solutions and emulsions of BHC.

Since various solvents which differ in toxic properties may be used, labels should bear the precautionary statements covering the combined hazards of BHC and the solvent.

Gamma isomer 100 per cent and above and formulations containing only gamma isomer.

Use the appropriate statements as indicated in other subdivisions of this sub-paragraph, except the caution of "May produce irritation of skin and eyes" will not be required.

(15) Chlordane.

Treat as DDT.

(19) Coaltar disinfectants.

Treat on the basis of percentage of phenols.

(23) Dichlorodiphenyldichloroethane (DDD-TDE-Rhothane D3).

Treat as DDT.

(24) Dichlorodiphenyltrichloroethane —for straight DDT.

Caution: DDT is toxic and when in solution can be absorbed through the skin. Harmful if swallowed. Avoid inhaling dusts and mist from spray. Avoid contamination of feed and foodstuffs.

Petroleum oil solutions containing not more than 25 per cent DDT.

Caution: Repeated or prolonged contact with skin can cause toxic symptoms. Avoid excessive inhalation or skin contact. In case of spillage on skin, wash with soap and water. Avoid contamination of feed and foodstuffs. Harmful if swallowed. (H.P.) Keep out of the reach of children. (H.P.).

For petroleum oil solutions containing more than 25 per cent DDT.

Caution: Contact with skin can cause toxic symptoms. Avoid inhalation and skin contact. In case of spillage on skin, wash immediately with soap and water. Avoid contamination of feed and foodstuffs. Do not use on household pets or humans. Harmful if swallowed. (H.P.) Keep out of reach of children. (H.P.).

For emulsions containing not more than 25 per cent DDT.

Caution: Repeated or prolonged contact with skin can cause toxic symptoms. Avoid excessive inhalation or skin contact. In case of spillage on skin, wash with soap and water. Avoid contamination of feed and foodstuffs. Harmful if swallowed. (H.P.) Keep out of the reach of children. (H.P.)

For emulsions containing more than 25 per cent DDT.

Caution: Contact with skin can cause toxic symptoms. Avoid inhalation and skin contact. In case of spillage on skin, wash immediately with soap and

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water. Avoid contamination of feed and foodstuffs. Do not use on household pets or humans. Harmful if swallowed. (H. P.) Keep out of reach of children. (H.P.)

For combustible mixtures; flash point between 80 and 150 F.

Use the appropriate statements as indicated in other subdivisions of this subparagraph and add:

Fire hazard: Caution—Do not spray into or near fire or open flame. Do not smoke while spraying.

For dust and powder formulations.

Caution: Avoid excessive inhalation. Avoid contamination of feed and foodstuffs.

DDT aerosols.

Caution: DDT is toxic and when in solution can be absorbed through skin. Do not spray directly on skin or on animals. In case of accidental contact, wash with soap and water. Avoid contamination of feed and foodstuffs. Remove birds, pets and fish bowls from rooms being sprayed. Avoid excessive inhalation of aerosol mist.

DDT for use on animals.

Caution: DDT is toxic and when in solution can be absorbed through the skin. Wash hands thoroughly with soap and warm water after handling the concentrate or using the diluted product on animals.

Note: If the preparation contains other hazardous ingredients or solvents, appropriate additional cautions must be added to the foregoing.

(26) 2,4-dichlorophenoxyacetic acid —(2,4-D) Acid and inorganic salts—20 percent and above.

Caution: Avoid inhaling dust. Avoid contact with skin, eyes or clothing.

Organic esters and amine salts.

Caution: Avoid contact with skin, eyes or clothing.

Note: Added warning statements regarding danger to crops through drifting dusts or sprays, should be used on all labels of 2,4-D formulations.

(33) Fluorides—Inorganic, water soluble fluorides 10 percent and above.

Do not breathe dust. Do not contaminate feed and foodstuffs. Keep out of reach of children and domestic animals.

Inorganic, water soluble fluorides, below 10 percent.

Caution: Harmful If Swallowed! Avoid prolonged breathing of dust. Avoid contamination of feed and foodstuffs. Keep away from children and domestic animals.

Fluosilicates, 5 percent and above.

Caution: Harmful If Swallowed! Avoid prolonged breathing of dust or spray mist. Avoid contamination of feed and foodstuffs. Keep away from children and domestic animals.

(37) Isopropylphenyl carbamate (IP C)—50 percent and above

Caution: Harmful If Swallowed!

(43) Nicotine and its salts—5 percent and above.

X Poison

Antidote:—Give a tablespoonful of salt in a glass of warm water and repeat until vomit fluid is clear. Have victim lie down and keep warm. Give strong tea or coffee. Give artificial respiration if breathing has stopped. Call a Physician Immediately!

Warning: May Be Fatal If Swallowed Inhaled or Absorbed Through Skin! Do not breathe vapor, fumes, dust or spray mist. Wear respirator. Do not get in eyes, on skin or on clothing. Wash thoroughly.

One percent to 5 percent solutions, and 2 percent to 5 percent dusts.

Warning: May Be Fatal if Swallowed, Inhaled or Absorbed Through Skin! Do not breathe vapor, fumes, dust or spray mist. Do not leave in eyes, on skin or on clothing.

Solutions below 1 percent.

Caution: Harmful If Swallowed! Avoid breathing vapor, fumes, dust or spray mist. Do not leave on skin or in eyes. Wash thoroughly. Avoid contamination of feed and foodstuffs. Keep away from children.

Dusts below 2 percent.

Caution: Irritating Dust!

(47) Parathion—Technical parathion and wettable powders 2 percent and above.

X Poison

Antidote: *Internal.* Give a tablespoonful of salt in a glass of warm water and repeat until vomit fluid is clear. Have victim lie down and keep warm. Call a Physician Immediately!

External. If the skin is accidentally contaminated, wash thoroughly with soap and water.

Warning: Extremely Hazardous if Swallowed, Inhaled or Absorbed Through Skin! Rapidly absorbed through skin. Do not get in eyes or on skin. Wear protective gloves, clothing and goggles. If spilled on skin, wash immediately with soap and warm water. Wear an effective mask or respirator. Do not contaminate feed and foodstuffs. Wash hands, arms and face thoroughly with soap and warm water before eating or smoking. Wash all contaminated clothing with soap and hot water before re-use.

Dusts: 2 percent and below.

Warning: Hazardous if Swallowed, Inhaled or Absorbed Through Skin! Avoid excessive inhalation and skin contact. Wear protective clothing, gloves and goggles. Wear an effective toxic dust respirator. Wash thoroughly with soap and warm water after exposure.

Aerosols—greenhouse use.

X Poison

Antidote: *Internal.* Give a tablespoonful of salt in a glass of warm water and repeat until vomit fluid is clear. Have victim lie down and keep quiet. Call Physician Immediately!

External. If the skin is accidentally contaminated, wash thoroughly with soap and water.

Warning: Extremely Hazardous if Inhaled or Absorbed Through Skin! Use only while wearing an effective full face mask with a GMC 1 canister or equivalent equipment. Replace canister as directed. Avoid contact with skin. Wear protective clothing and gloves. Wash exposed skin with soap and warm water after use of the bomb. Wash contaminated clothing with soap and hot water before re-use. Do not contaminate feed and foodstuffs.

(53) Pyrethrum.

No requirements unless other ingredients in the formulation require it.

(56) Red squill powder and extracts; any effective concentrations.

Caution: Avoid contamination of feed and foodstuffs. (H.P.) Keep away from children and domestic animals.

(57) Sabadilla powder.

Caution: Avoid breathing dust.

(59) Sodium fluoroacetate (1080); any concentration.

X Poison

Antidote: *Internal*—Speed is essential. Immediately give a tablespoonful of salt in a glass of water and repeat until vomit fluid is clear. Then give two tablespoonfuls of epsom salt in water Have victim lie down and keep quiet. Call a Physician Immediately!

Warning: For Use By Trained Operators Only! May cause secondary poisoning in other animals, so pick up and burn or bury deeply, all carcasses of pests killed by 1080. Burn all surplus bait or containers. Keep pets and domestic animals confined away from baited areas. Do not contaminate feed and foodstuffs. Keep out of reach of children.

(62) Tetraethyl pyrophosphate—1 percent and above.

Antidote: *Internal.* Give a tablespoonful of salt in a glass of warm water and repeat until vomit fluid is clear. Have victim lie down and keep warm and QUIET. Call A Physician Immediately!

External. Wash with large amounts of soap and water.

Warning: Extremely Hazardous If Swallowed, Inhaled Or Absorbed Through Skin Or Eyes! Avoid skin or eye contact with concentrated spray, inhalation of spray mist or prolonged contact with diluted spray. Wear protective clothing and goggles and an effective respirator. Remove outer garments and wash exposed skin with soap and water before eating or smoking. Persons showing toxic symptoms should be removed from the job immediately.

Below 1 percent.

Warning: Extremely Hazardous If Swallowed, Inhaled Or Absorbed Through Skin or Eyes! Avoid skin or eye contact with concentrated spray, inhalation of spray mist or prolonged contact with diluted spray. Wear protective clothing and goggles and an effective respirator. Remove outer garments and wash exposed skin with soap and water before eating or smoking. Persons showing toxic symptoms should be removed from the job immediately.

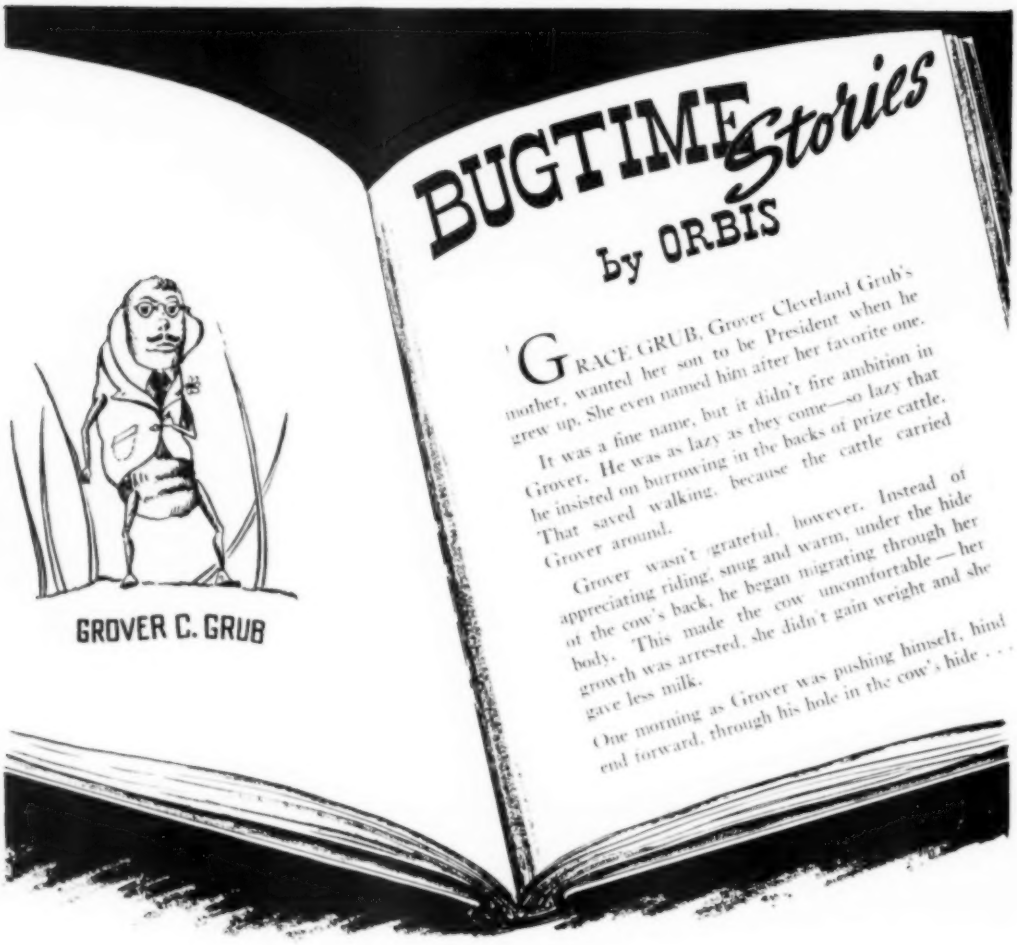
(66) Toxaphene (chlorinated camphene)— Dry formulations—25 percent and above.

Warning: May Be Fatal if Swallowed! Do not breathe dust or spray mist. Do not get in eyes, on skin or on clothing. Wash thoroughly.

Toxaphene and dry formulations below 25 percent.

Caution: Harmful If Swallowed! Avoid prolonged breathing of dust or spray

(*Continued on Page 66-B*)


BUGTIME Stories
by ORBIS
GRACE GRUB, Grover Cleveland Grub's mother, wanted her son to be President when he grew up. She even named him after her favorite one.
It was a fine name, but it didn't fire ambition in Grover. He was as lazy as they come—so lazy that he insisted on burrowing in the backs of prize cattle. That saved walking, because the cattle carried Grover around.
Grover wasn't grateful, however. Instead of appreciating riding, snug and warm, under the hide of the cow's back, he began migrating through her body. This made the cow uncomfortable — her growth was arrested, she didn't gain weight and she gave less milk.
One morning as Grover was pushing himself, hind end forward, through his hole in the cow's hide . . .
GROVER C. GRUB

—he ran into an Orbis Insecticide and that was the end of Grover C. Grub!

Orbis Cube or Derris Rotenone Powder, Cube or Derris Rotenone Resins, Rotenone Crystals, Technical Rotenone and DDT Compounds do it *all the time!*

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Northeastern Weed Conference Program Covers Wide Range of

CHEMICAL HERBICIDES

FOLLOWING is the program for the 1950 meeting of the Northeastern Weed Control Conference, to be held at the New Yorker Hotel, New York, January 3, 4 and 5. According to Thomas R. Cox, American Cyanamid Co., New York, program chairman, the Empire State Potato Club and the New York Vegetable Growers' Association will meet with the weed control group concurrently, beginning January 4th.

A trade show "much larger" than the one of last year, will extend throughout the entire length of the three-day sessions, according to Dr. G. H. Ahlgren, Rutgers University, New Brunswick, N. J., in charge of that phase of the meeting.

Chairman of the opening session Tuesday morning will be Dr. R. D. Sweet, Cornell University, president of the Northeastern Conference. On this program will be Dr. K. S. Quisenberry, head of the Division of Cereal Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, U.S.D.A., Washington, D.C. His topic will be on cooperative weed control research. "The Persistence of Herbicides in Soils" will be discussed by A. G. Norman, U. S. Army Chemical Corps, Camp Detrick, Maryland; and John W. Mitchell, U.S.D.A., will present a paper, "Absorption of Radioactive 2, 4-D as Affected by Wetting Agents."

Donald P. Watson, Michigan State College, will report on "An Anatomical Study of the Modification of Bean Leaves as a Result of Treatment with 2, 4-D"; Charles L. Hamner, also of Michigan State College, will discuss "Changes in the Nutritional Value of Plants Sprayed with 2, 4-D." "Drift and Volatility Comparisons of an Amine Salt and Ester Form of 2, 4-D Under Field Conditions," by A. J. Tafuro, J. D. Van Geluwe and L. E. Curtis, G.L.F. Soil-Building Service, will be presented also.

Three Rutgers University specialists, Dale E. Wolf, Frank Sowa and Dr. Ahlgren, are authors of "The Relative Volatility of Some Forms of 2, 4-D," to be presented; while "Some Aspects of Spraying and Evaluating Field Plot Experiments with Plant Growth Regulators," written by W. B. Ennis and A. G. Norman, Camp Detrick, will follow.

J. C. Bates, N. Tischler and G. P. Quimba, Sharples Chemicals, Inc., Philadelphia, are authors of the next paper, "A New Group of Defoliant-Herbicidal Chemicals"; and following it, H. L. Yowell, Esso Laboratories, vice-president of the Northeastern Weed Conference, will report "Progress in the Herbicidal Application of Oils." L. V. Sherwood, Monsanto Chemical Co., St. Louis, Mo., will present "Pentachlorophenol as an Herbicide"; and Wm. E. Meek, Sr., U.S.D.A. Agricultural Engineer, will discuss engineering developments in weed control. Along the same general line, the following two papers by S. M. Raleigh, Pennsylvania State College and C. W. Terry, Cornell University, will cover "Apparatus for Spraying Small Plots" and "Do Sprayers Give Uniform Coverage?" respectively.

Wednesday's session will open with W. H. Lachman, Massachusetts State College, as chairman. Glenn E.

(Turn to Page 71)

G. H. Ahlgren
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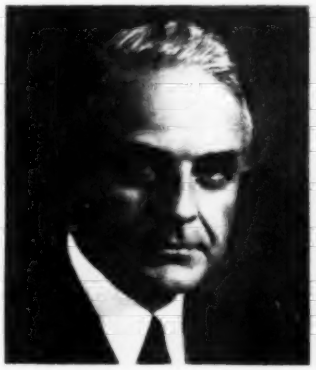
P. V. Cardon
To Speak at Annual Banquet



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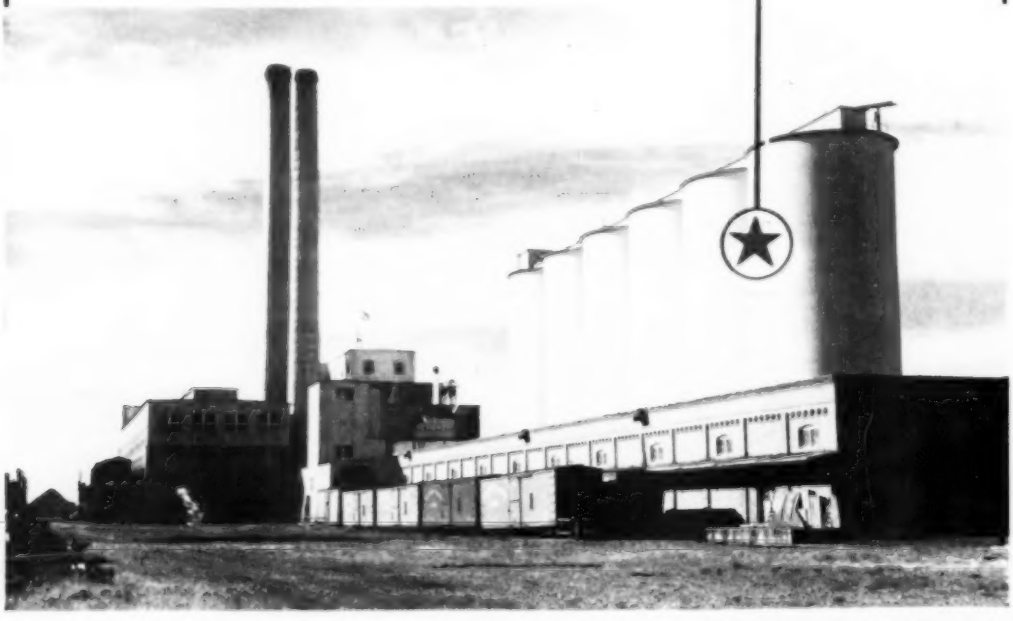

The Listening Post

This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Plant Disease Survey Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

By Paul R. Miller

IN the *Listening Post* for September (page 77), we reported that very favorable results had been obtained in Arkansas from tests using a commercial preparation of sodium hypochlorite ("Clorox") for the control of peach brown rot and bacterial spot. In similar tests now reported by Panos L. Poulos of the Delaware Agricultural Experiment Station, sodium hypochlorite ("Clorox") failed to give control of brown rot (caused by *Monilinia fructicola*), in Delaware, both when applied as a pre-harvest spray and when used as a chemical dip for harvested fruit.

Phytotoxicity tests were made June 3 and 9 to determine concentrations of "Clorox" that would be safe for use as a pre-harvest spray. Tests included concentrations ranging from 64.5 to 2000 ppm of chlorine, on the Summer Crest, White Hale, and Fisher varieties. Concentrations of 250 to 2000 ppm chlorine (1 to 8 gallons of "Clorox" per 100 gallons of water) produced bleaching symptoms on the foliage two to five days after the first application. The young fruit was not injured at any concentration. The average temperature at the time of application was 86° F., and the humidity was high.

In the pre-harvest spray experiments, sodium hypochlorite ("Clorox") was used at a concentration of 100 ppm chlorine (0.4 gallons of "Clorox" to 100 gallons of water), alone and with the addition of 3 pounds of "Sulforon X" to 100 gallons, on the Early Redfree variety at Rising Sun, and on Halehaven and Elberta at Bridgevile. Average temperatures throughout the pre-harvest period were from 85°-90° F. at the times of application. Rainfall was very light but humidity was high. There was no indication of foliage injury. Results of these tests were as follows:

Early Redfree—Two applications, June 21 and 29. Counts made July 5. Percentage of brown rot: untreated 36; "Clorox" alone 46; "Clorox" plus "Sulforon X" 39.

Halehaven—Three applications, July 14, 19, 23. Counts made July 24. Percentage of brown rot: untreated 8; "Clorox" alone 14; "Clorox" plus "Sulforon X" 7.

Elberta—Five applications, July 18, 24, 29, August 4, 8. Counts made August 8, 11. Percentage of brown rot: untreated 20; "Clorox" alone 19; "Clorox" plus "Sulforon X" 20.

These results indicate that sodium hypochlorite ("Clorox") did not control peach brown rot under the conditions of the experiments in Delaware.

Since the material was not toxic to the fruit at any of the concentrations tested, it was included in chemical dip tests on three varieties for the control of brown rot in the package, using 250 to 4000 ppm chlorine (1 to 16 gallons of "Clorox" to 100 gallons of water). The peaches were brushed, graded, dipped for one minute, drained for five minutes, packed in open-staved half bushel baskets with liner and lid, and stored at room temperature (approximately 60° F.) for four days, then scored for rot control. At 250 to 1000 ppm chlorine (1 to 4 gallons of "Clorox" to 100 gallons of water) the color of the peach was enhanced. Concentrations of 2000 to 4000 ppm chlorine (8 to 16 gallons "Clorox" to 100 gallons of water) caused a slight brown mottling on the surface of the peach.

Results, given in Table 1, indicated that this material was not effective as a chemical dip for the control of peach brown rot in the package.

Bitter Rot Reported

J. L. Weimer and J. C. Dunegan report cooperative investigations between the U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering and the Georgia Agricultural Experiment Station. One of the most common of the fungi causing anthracnose diseases is *Glomerella cingulata*, best known as the cause of bitter rot of apple fruits which becomes serious at times in southern apple-growing regions. Re-

TABLE I

Results from tests with sodum hypochlorite ("Clorox") as a chemical dip for the control of the brown rot disease of peach in the package, in Delaware.

Treatment	Conc./100 gal.	ppm Cl	Percentage Brown Rot		
			Triogem	Halehaven	Elberta
Untreated	—	—	29.4	82.4	30.4
Water dip	—	—	34.5	87.4	60.8
Liquid lime sulfur	2 qts.	—	15.1	48.5	17.7
Liquid lime sulfur + Clorox	2 qts.-4 gal.	1000		30.7	
Clorox	16 gal.	4000		36.9	56.5
ditto	8 gal.	2000		63.6	47.0
ditto (dipped for five minutes)	8 gal.	2000		54.5	36.5
ditto	4 gal.	1000	15.5	59.0	26.5
ditto	2 gal.	500	22.8	—	—
ditto	1 gal.	250	27.3	—	—
L. S. D. at 5% Level			12.8	18.7	8.0

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Alkyl Amine Salts	Diethyl Amine Triethyl Amine Isopropyl Amine	Low cost— Low equivalent weights (Smaller quantities are needed to neutralize 2,4-D acid)— Isopropyl Amine is anhydrous (Saving freight and storage costs)—
Esters	Isopropanol n-Butyl Alcohol	Low molecular weight— Low cost— 2,4-D esters are soluble in light hydrocarbons— 2,4-D esters are water-insoluble, therefore effective in rainy areas—

And here are the additives

Polyethylene Glycol 400 Monooleate	Emulsifier in 2,4-D esters
Butyl CELLOSOLVE	Coupling agent for 2,4-D esters
CARBITOL	Anti-freeze for alkanolamine—2,4-D concentrates
TERGITOL Dispersant TMN-650	Lime soap dispersant for amine-2,4-D formulations used in hard-water areas

Further information about these chemicals can be obtained by writing or calling the nearest CARBIDE office. When writing please address Department DL

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cently, bitter rot or anthracnose of peach fruit caused by this fungus has been reported, from Georgia and Maryland, and experiments showed that the organism from peach could infect apples as well as peaches.

Another plant on which this anthracnose has become important in the last several years is the blue lupine, widely used in the South as a winter cover or green manure crop. The fungus isolated from lupine also was indistinguishable from apple isolates in appearance and ability to decay apple fruit. Since the blue lupine is now planted extensively as a winter cover crop in and near peach orchards in Georgia, and since both lupine and peach are attacked by *Glomerella cingulata*, it was desirable to determine definitely whether the strain of the fungus from one of these hosts can infect the other.

On February 18, 1949, spores from two isolates of the fungus, (*G. cingulata*), one from peach and one from lupine, were atomized onto young blue lupine plants growing in sterilized soil in the greenhouse. Control plants were atomized with sterile tap water. After being inoculated, the plants were held in a moist chamber for 68 hours and were then returned to the greenhouse bench. Early stages of infection were observed on the petioles of inoculated plants within 68 hours. On February 25, all of the petioles of the plants inoculated with the fungus from peach were dead, and typical anthracnose lesions were present on the leaflets. Infection of the plants inoculated with the isolate from lupine was unmistakable, but the lesions were less abundant because the isolate produced relatively few spores. There were no anthracnose lesions on the control plants.

On March 28, 1949, further inoculations were made by using the same method. In addition to the two isolates, one from lupine and one from peach, used previously, a reisolate of the fungus from lesions on a lupine plant inoculated with the isolate from peach in the earlier experiment was used. The inoculated lupine plants and controls were held in the moist chamber for 48 hours. Observations made on April 1 showed that the plants inoculated with the isolate from peach were heavily infected. Stems, petioles, and leaflets on most of the inoculated plants showed many typical anthracnose lesions. By May 6, 21 out of 28 plants inoculated with the peach isolate were diseased, the remainder being healthy. Of the 21, 12 were dead and the other were more or less severely injured. One of the 10 plants inoculated with the reisolate from the previous experiment remained healthy, one was dead, and the others were severely injured. Eight of the nine plants inoculated with the isolate from lupine were diseased, and one remained healthy.

On June 23, 1949, 25 Dixigem peach fruits were used in an experiment to determine the ability of these isolates to attack peach. The hand-ripe fruit were washed with tap water, disinfected in $HgCl_2$ 1-1000 for two minutes, and then washed with sterile tap water. Five fruit were wounded with a sterile scalpel, and

(*Turn to Page 67*)

Fewer Japanese Beetles Seen for 1950

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Dr. Haeussler is in charge of Insect Pest Survey and Information, Agric. Research Adm., B. E. & P. Q., U.S.D.A. His observations are based on latest reports from collaborators in the department's country-wide pest surveys.

By G. J. Haeussler

OBSERVATIONS made by entomologists of the Moorestown, New Jersey laboratory of the Bureau of Entomology and Plant Quarantine indicate that weather conditions during the past summer in much of the northeastern part of the United States may result in fewer beetles next year. Extremely hot, dry weather during the summer kills many of the eggs and newly hatched grubs. Most of the area over which the beetle occurs from Maine to North Carolina and west to Ohio, experienced a combination of unusually high temperature and deficient summer rainfall in 1949.

The beetle was especially numerous again this year in western Maryland and adjacent parts of northern Virginia. Heavy infestations also occurred in the Eastern Panhandle area of West Virginia. Beetles were somewhat less numerous in northeastern Maryland although they appear to have increased there over the numbers present last year. In southern New Jersey, eastern Pennsylvania, Delaware, southeastern Maryland, and eastern Virgina infestations were spotty, the number of beetles present being about the same or slightly less at some points than in 1948. A reduction in the number of beetles was noticeable this year on Long Island, northern New Jersey, southeastern New York, and in New England, especially in those areas where drought was most severe during the late summer and early fall of 1948.

Slight Activity Seen

RELATIVELY few reports of current insect conditions are being received at this time of year. Available reports indicate, however, that heavy infestations of the Mexican bean beetle continued throughout October in the southeastern part of the country and light to moderate infestations were reported as far northward as Virginia.

Infestations of the corn earworm in beans appear to have been heavier than usual for this time of the year. Reports of injury were received from South Carolina, Georgia, Florida, Louisiana, the Lower Rio Grande Valley of Texas, and southern California. This insect caused severe injury to lettuce in eastern Virginia and in the Salt River Valley

(*Turn to Page 67*)

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Suppliers' Bulletins

Velsicol Tech. Bulletins

Velsicol Corporation, Chicago, Ill., has recently published two bulletins on insecticides. These are: Bulletin #32: "Control of insect pests such as fleas, ticks, mange mites, commonly occurring on dogs." Bulletin #33 is a technical release on ants and their control. Copies of the bulletins may be obtained by writing the company, 330 E. Grand Ave., Chicago, Ill.

•

Spencer Fertilizer Book

Spencer Chemical Co., Kansas City, has issued a new 36-page book, "The Fertilizer Industry and Spencer Chemical Company," giving complete information on the part played by the firm in furnishing materials for the fertilizer industry. It presents tables showing the average composition of fertilizer materials, sources of these materials, use of mixed fertilizers and those made for direct application to the soil; and numerous charts and drawings illustrating mixing, grinding, etc. Three charts in color show the fluctuations of wholesale unit prices of fertilizer materials at producing points for the past 30 years, and the wholesale price indexes and mixtures from the first World War period to the present.

Also included in the book are notes on mixing; the use of base goods; and a major feature on fertilizer mixing plants. In the latter article, photographs of mixing machinery are presented, many of them with cut-away sides to show the inner workings; material handling devices, drawings of ideal plant layouts, and a table giving estimated initial expenditures and annual costs of operating a 5,000 ton-per-year fertilizer plant. Manpower requirements are also estimated in a subsequent table, and the book ends with a table summarizing the estimated building and equipment costs of various size plants, ranging from a 5,000 ton unit to a 20,000 ton plant. The figures are given as of July 1, 1949, with the explanation that they are given for comparative purposes, and will of course vary considerably in different locations and under differing market conditions. The book is available from Spencer Chemical Company, Dwight Building, Kansas City 6, Mo.

•

Weed Killer Booklets Out

Monsanto Chemical Co., St. Louis, Mo. has issued an integrated series of seven booklets describing the methods and advantages of controlling agricultural weeds with chemical spray. Instructions for formulating the company's basic herbicidal chemicals, both contact and translocated, and the proper compounds and rates of application are given. Specific booklets on chemical weed control on rights-of-way; in small grains, orchards and vineyards are included in the series. The series may be obtained by writing Monsanto Chemical Co., St. Louis 4, Mo.

Announces New Scale

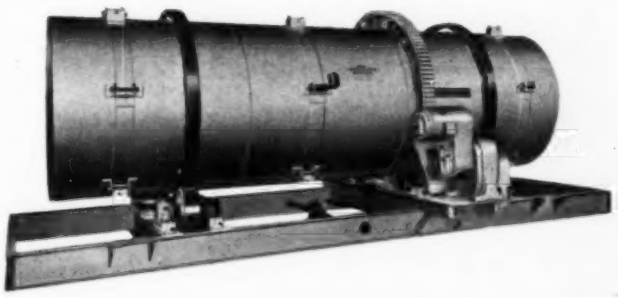
Automatic Scale Co., New York, has announced its new "515-B Sacking Scale," designed for sacking fertilizer. The makers say that the machine is fast, accurate, and rugged, yet simple enough that workers can learn to operate it within a short time. The device can bag from 25 to 35 tons per hour, with automatic valve opening mechanism. Accuracy does not depend upon the skill of the operator. Literature is available from the company, P.O. Box 46, Village Station, N.Y.

•

Offers Bag Booklet

Bemis Bro. Bag Co. has issued a booklet, "Pocket Guide to Bemis Products," which illustrates and describes more than 40 general types of products and special services available through the company. Cotton, multiwall paper, and transparent bags are described, along with other miscellaneous products marketed by the firm, including filling and closing machinery for use in operations like fertilizer plants. Copies of the 16 page booklet are available from the company, 408 Pine St., St. Louis 2, Missouri.

Announces Granular Fertilizer Process



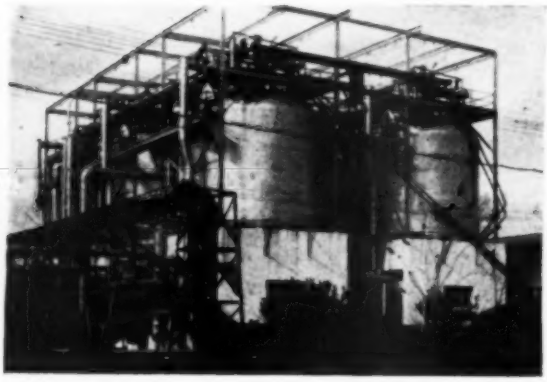
Sturtevant Mill Co., Boston, has announced a new process for manufacturing granular or pelletized fertilizer, producing granules of uniform size. The Sturtevant granulator, a unit of the complete granulation process, is shown here. The makers state that the unique design and rugged construction of the granulator assure that the equipment will have long operating life and a minimum, if any maintenance cost.

In discussing the advantages of granular fertilizer, the manufacturers state that this type of fertilizer may be stored without caking, thus enabling the plant to prepare in advance for an anticipated market. Granular fertilizer, it is pointed out, holds its chemical properties without deterioration, and when applied to the soil, does not leach as quickly as other types. Literature on the process is available from the Sturtevant Mill Co., 123 Clayton St., Boston 24, Mass.

SULPHUR

*Interesting Facts Concerning This Basic Raw Material from the Gulf Coast Region

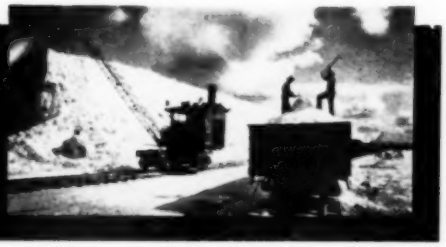
*SUPERHEATED WATER . . .



Mining operations are most successfully carried out if the water pumped into the sulphur deposit is heated under pressure to a temperature of about 320° F. For large scale mining, enormous quantities of water are required, so, a primary requisite is an adequate supply of suitable water and an efficient power plant in which to heat it.

To insure a continuous supply of water at Newgulf, it is the practice to use river water pumped in time of flood or full flow and stored in large reservoirs. This supply is supplemented, when necessary, with well water. Water so obtained is seldom suitable for use in boilers or mine water heaters without being treated first because of natural salts in solution. Softening by chemical treatment is necessary to prevent deposition of scale on boiler tubes and hot water lines.

Loading operations at one of the huge vats of Sulphur at our Newgulf, Texas mine. Such mountains of Sulphur are constantly being built at our mines, from which shipments are continually made.



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Tampa is Scene of 61st Meeting of Economic Entomologists to Discuss

New Insecticides, Residues, Toxicity

THE stage was set and the program complete for the 61st annual meeting of the American Association of Economic Entomologists, as we went to press. The convention, scheduled for December 13-16, was to be held at the Tampa Terrace Hotel, Tampa, Fla., where the A.A.E.E. was scheduled to meet jointly with three other groups. The other three were the Entomological Society of America; the Cotton States Branch of A.A.E.E. and the Florida Entomological Society.

Scores of papers were to be presented, covering many phases of entomology, insecticides, toxicity, residues, and new products. In the latter, the manufacturing industry, official agencies and independent research groups were invited to announce new insecticides either for experimental or commercial use in 1950. Each speaker had been asked to furnish mimeographed copies of his introduction for distribution at the meeting, and each speaker's subject was to be cleared through the committee before the actual presentation.

Particular attention was to be focused on chemical residues in plant and animal products, including discussions covering the presence of insecticide residues in meat and milk as a result of the animal's having been treated with various toxicants. Chemical residues in milk of dairy cows which have consumed various amounts of insecticide in feeds were to receive a considerable amount of attention also. Frank C. Nelson, retiring president of the Eastern Branch, was scheduled to preside here.

Another phase of insecticide application appearing prominently on the program, was a session on equipment, with Cameron Siddall, Bryan, Texas, chairman. This session was to cover recent developments and trends in new equipment; new types of spraying and dusting equipment to be used in 1950; and a new mist concentrate applicator for treating fruit trees was to be discussed. Speakers were to include Earl D. Anderson, secretary, National Sprayer and Duster Ass'n., Chicago; James L. Brann, Cornell University, Ithaca, N. Y.; H. G. Ingerson, John Bean Div., Food Machinery Corporation, Lansing, Michigan; and Kenneth Messenger, Agricultural Engineer, U.S.D.A., Washington, D. C.

The annual Entomologists' dinner was scheduled to be held in the Palm Room of the Terrace on Wednesday evening, followed by entertainment and a dance. Preceding the banquet a social and cocktail hour was to be held in the Veranda Room of the hotel.

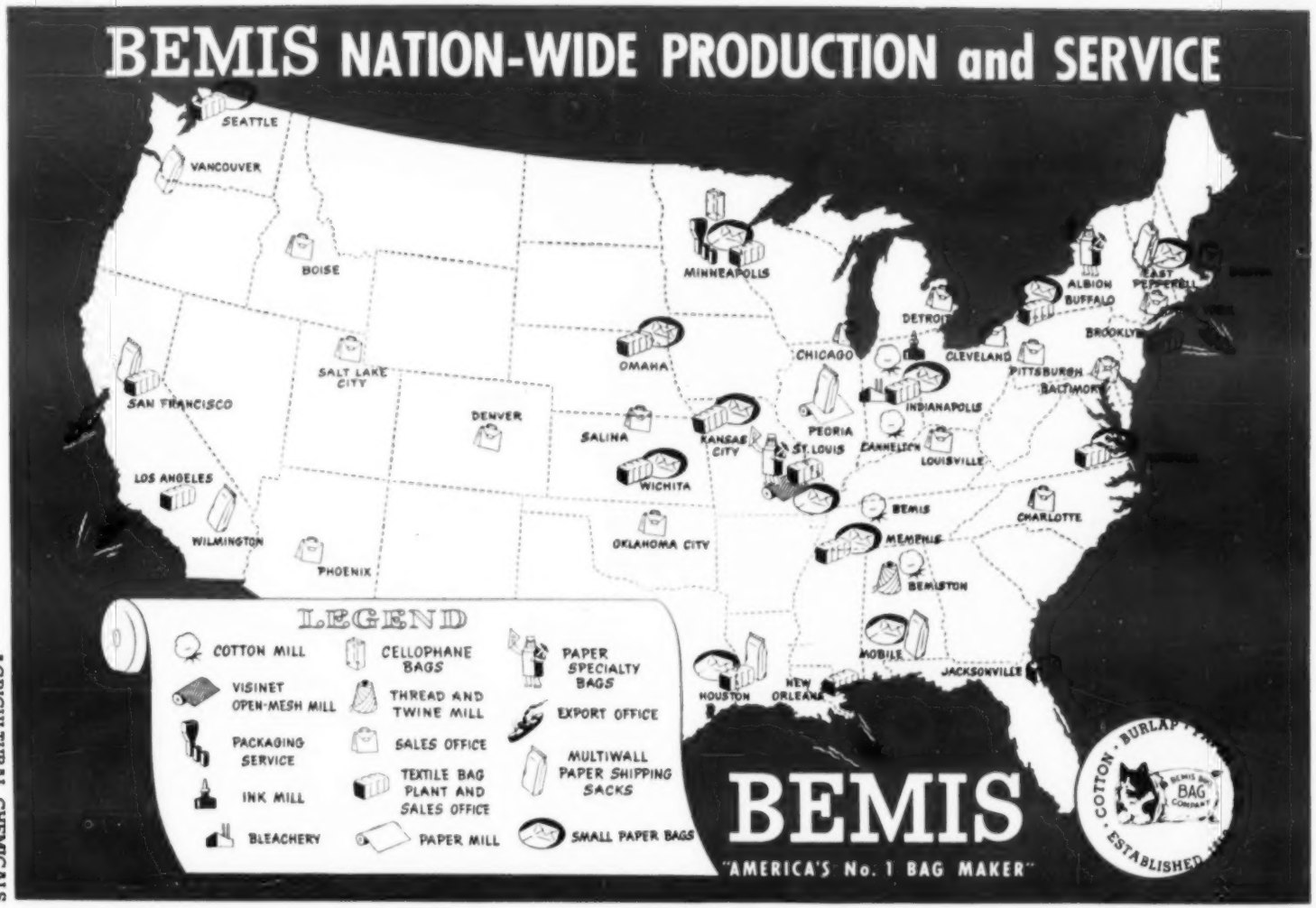
Special programs were set up for the entertainment of ladies attending the convention. These included a tea on Tuesday afternoon, a tour to beaches in the vicinity of Tampa, Wednesday morning; a tour of the city, a bridge party, luncheon at the Yacht Club and a bus tour to citrus groves, processing plants, the Citrus Experiment Station, and other points of interest.

The program committee was headed by Dr. E. F. Knipling, U.S.D.A., Washington, D. C., with H. G. Johnston and Floyd Andre comprising the remainder. Officers for 1949 were Dr. A. M. Boyce, chairman of the Division of Entomology, University of California, Riverside, president; Dr. C. P. Clausen, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, vice president; and Dr. E. N. Cory, University of Maryland, College Park, Md., secretary-treasurer.

P. N. Annand
Chief of Bureau of Entomology and Plant Quarantine on program.

F. C. Bishopp
Reports preliminary tests with pyrethrin-like materials.

George C. Decker
Discusses tolerance of insects for pesticidal compounds.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INDUSTRY NEWS

Cornell Conference Attracts 300

OVER three hundred representatives of insecticide, fungicide and allied manufacturers, experiment stations, USDA and agricultural colleges attended the 11th annual New York State Insecticide and Fungicide Conference, and the 2nd annual Pesticide Application Equipment Conference held jointly at Cornell University, Ithaca, N. Y. on Nov. 14, 15 and 16. Dr. L. M. Massey and Dr. Charles E. Palm, both of New York State Agricultural College at Cornell, conducted the meetings.

Leading experts from all parts of the country delivered papers. Various insect and plant disease control recommedations for 1950 were given by Drs. R. W. Leiby, C. Chupp, D. W. Mills and A. A. LaPlante of Cornell. Problem forums with leading growers and others taking part were conducted.

On Tuesday evening, Nov. 15, a get-together banquet was held at the Hotel Ithaca with Dr. Palm presiding. He outlined that the conference this year was the largest yet held and that representatives from twenty states were present as well as nineteen persons from Canada, England and New Zealand. Thirteen universities and 110 manufacturers were represented. Meeting sessions were held in Bibbins Hall in the G. L. F. Building in Ithaca. A rising vote of thanks to G. L. F. for making available its building for meeting facilities without cost to the Conference was adopted unanimously.

Listed among the speakers were Dean W. I. Myers of Cornell, Drs. K. G. Parker, C. W. Terry, J. L. Brann, W. W. Gunkel, O. C. French, S. F. Potts, Phillip Garman, J. G. Matthysse, E. F. Taschenberg, G. E. Hervey, A. G. Newhall, T. N. Hurd, A. B. Groves, L. B. Norton, A. W. Avens, P. J. Chapman, M. B. Hoffman, E. H. Glass, E. H. Smith, Ralph Dean, O. A. Reinking, H. C. Huckett, W. A. Rawlins, W. T. Schroeder, B. Lear, R. E. Wilkinson, A. W. Dimock, W. E. Blauvelt, F. L. Gambrell, H. C. Young, Jr., H. H. Schwardt, and J. E. Dewey. Among those on the growers' panel discussion were Cyril Small, Morton Adams, D. M. Dalrymple, P. J. McManus, and Hugh Benjamin. Joseph Noone of the National Agricultural Chemicals Association also spoke on the coming tolerance hearings in Washington, followed by a question and answer period.

On Monday evening, Nov. 14, a demonstration of experimental application equipment was held at the Cornell Animal Husbandry Judging Pavillion. This followed the afternoon program which was given over wholly to application equipment and application problems. Plans for the 1950 conference are also in charge of Drs. Massey and Palm.

MEETINGS

American Association of Economic Entomologists. 81st Annual Meeting. Tampa, Florida. December 13, 14, 15, 16, 1949.

Third Annual Cotton Insect Control Conference. Tutwiler Hotel. Birmingham, Ala., December 19 & 20.

American Phytopathological Society. Martinique Hotel. New York. December 28, 29 & 30. (In conjunction with American Association for Advancement of Science.)

Northeastern States Weed Control Conference. Hotel New Yorker. New York. January 3-5, 1950.

Northwest Vegetable Insect Conference, Portland, Oregon. January 3-5.

Nebraska Weed Control Conference. Chemical & Equipment Show. State Fair Grounds. Lincoln, Nebr., January 5 & 6.

Western Colorado Horticultural Society. 7th Ann. Meeting. Mesa College, Grand Jct., Colo., January 6 & 7.

Pennsylvania Farm Show. Harrisburg, Pa., January 9-13.

Utah State Horticultural Society Meeting. Hotel Utah. Salt Lake City. January 13 and 14.

University of Illinois Spray School. Urbana, Ill., January 17-19.

Texas Entomological Society. Rice Hotel. Houston, Texas. January 19 & 20.

Southern Association of Science and Industry. Hotel Roosevelt. New Orleans, La., January 23-24.

Western Weed Control Conference. Denver, Colorado. January 31 to February 2.

Association of Southern Agricultural Workers and Southern Weed Control Conference. Biloxi, Miss., Feb. 8-10.

12th Annual Kansas State Weed Conference. Topeka, February 15 and 16.

Midwestern Shade Tree Conference. La Salle Hotel. Chicago. February 15-17.

North Central Branch, A.A.E.E., President Hotel, Kansas City, Mo., March 23 & 24.

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Western Weed Meeting

The program was fast taking shape at press time for the Western Weed Conference, to be held at Denver, Colorado, January 30 and 31, and February 1, 1950. Headquarters for the three-day event will be the Cosmopolitan Hotel, and registration will start at noon on Sunday, January 29.

According to Walter S. Ball, Sacramento, Calif., secretary-treasurer of the group, the program is expected to include complete discussions on research relative to new developments and improved methods; a comprehensive exhibit of spray materials and application equipment by the industry; and a study of weed control problems in connection with nationally-owned and controlled lands. Mr. Ball points out that in the West, large areas are either owned or controlled by the government, such as the large national parks. In these cases, the problem of weed control becomes an important one to the states in which these areas lie.

A panel of research workers will be presented at the meeting, to present any new developments and improved methods in the field of weed control, Mr. Ball states. Names of panel members had not been announced late in November, but the entire list, along with remainder of the Denver program, was expected to be available for publication in the January issue.

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P.I.I. Elects Officers

The Pacific Insecticide Institute elected as its president, David T. Prendergast at the 20th annual meeting of the group at the Hotel Claremont, Berkeley, Calif., November 2nd. The first day's program consisted of a business meeting, luncheon, and a panel discussion.

In conjunction with the Pacific Chemical Exposition, the P.I.I. sponsored a public meeting in the Civic Auditorium, San Francisco, the next day, November 3. Speakers at this section included G. S. Hensill, California Spray-Chemical Corp.; C. O. Persing, Stauffer Chemical Co.; A. F. Swain, Eston Chemical Co.; D. B. Scott, Sherwin-Williams Co.; R. N. Raynor, Dow Chemical Co.; L. G. Smith, Shell Chemical Co.; Charles D. Thurmond, Monsanto Chemical Co.; Merle Ward, E. I. duPont de Nemours & Co.; W. E. McCauley, Julius Hyman & Co.; Lloyd Rooke, American Cyanamid Co.; C. C. Cassil, Niagara Sprayer Division, Food Machinery Corp.; L. L. Isenhour, Rohm & Haas Co.; and Weller Noble, Pacific Guano Co. G. F. MacLeod, Sunland Industries, was chairman of the meeting.

Other P.I.I. officers elected, in addition to Mr. Prendergast, included A. M. Esberg, vice-president and W. D. Gray, secretary-treasurer. Directors named were E. F. Bashor, E. H. Littooy, G. F. MacLeod, Roy E. Miller, Mr. Prendergast, Edward Schuler and M. F. Wharton.

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Midwest Shade Tree Conf.

The fifth Midwestern Shade Tree Conference will be held at the LaSalle Hotel, Chicago, February 15, 16, and 17, 1950, according to Alfred F. Carlstrom, secretary.

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Pesticide Census, 1947

Lack of space in the November issue forbade our presenting the actual table of the U. S. Department of Commerce Census of Manufactures, 1947, although we did present a summary. Below is the table, presenting the essential information:

TABLE 6.—QUANTITY AND VALUE OF PRODUCTS, TOTALS FOR THE UNITED STATES: 1947 AND 1939

PRODUCT	Unit of measure	1947			1939	
		Total shipments and interplant transfers		Production (quantity)	Produced for sale	
		Quantity	Value f.o.b. plant		Quantity	Value f.o.b. plant
Aerosols (net weight)	Pound	4,321	7,123	4,190	n.a.	n.a.
Fly sprays, total			7,284		52,471	[19] 7,837
Livestock sprays with DDT:						
Oil base			737		n.a.	n.a.
Water base	Gallon	33	42	36	n.a.	n.a.
Livestock sprays without DDT	do	137	415	137	n.a.	n.a.
Household sprays with DDT:						
Oil base	do	3,012	3,942	2,818	n.a.	n.a.
Water base	do	24	32	25	n.a.	n.a.
Household sprays without DDT:						
Oil base	do	839	2,052	864	n.a.	n.a.
Water base	do	70	84	72	n.a.	n.a.
Animal dips [20]	do	239	196	262	n.a.	n.a.
Rodent poisons			1,652		n.a.	n.a.
Fumigants (household industrial and soil)	Pound	1,338	352	1,340	n.a.	n.a.
Household insecticides and repellents, not specified by kind			3,068		n.a.	6,480
Weed killers (preparations), total			87,924			
Arsenical			1,364			
Sodium chlorate			1,087			
2, 4-D (2, 4-dichlorophenoxyacetic)			3,667		n.a.	n.a.
Other weed killers (hydrocarbon weed killers, etc.)			1,587			
Weed killers, not specified by kind			219			
Chemical products, not specified by kind			20,043			
Insecticides and fungicides for agricultural use, total			77,904			
Arsenical preparations:						
Lead arsenate [21]	Pound	12,040	2,085	12,402	59,569	$5,422
Calcium arsenate [22]	do	22,145	1,900	24,929	59,282	1,912
Other arsenical insecticides and fungicides (including Paris green)	do	13,742	1,334	18,489	[23] 2,040	[23] 480
Sulfur containing preparations:						
Wettable sulfur and sulfur dust	do	158,120	3,236	158,041	[24] 36,708	[24] 999
Lime sulfur (solution and dry)			1,641			[23] 925
Other sulfur containing insecticides and fungicides			3,113		n.a.	n.a.
Copper containing dry preparations			3,609		n.a.	n.a.
Zinc containing preparations	Pound	6,225	711	7,447	n.a.	n.a.
Fluorine containing preparations:						
Sodium aluminum fluoride dusts and mixtures			767		[24] 1,261	[24] 422
Other fluorine containing insecticides and fungicides			99		n.a.	n.a.
Nicotine containing preparations (including dusts, excluding nicotine sulfate)	Pound	7,235	1,709	7,366	n.a.	n.a.
Nitrated phenols and cresols (except weed killers)	do	1,086	531	894	n.a.	n.a.
Rotenone containing insecticides and fungicides:						
Dusts	do	19,494	4,141	19,762	[25] 3,245	[25] 567
Sprays (except fly sprays)	Gallon	535	450	522		
Pyrethrin containing insecticides and fungicides:						
Dusts	Pound	2,274	444	2,334	[24] 3,968	[24] 1,223
Sprays (except fly sprays)	Gallon	236	923	247	n.a.	n.a.
Benzene hexachloride preparations without DDT	Pound	13,301	3,319	12,523	n.a.	n.a.
DDT containing preparations (except aerosols and fly sprays):						
Containing DDT as the active ingredient	do	86,875	16,141	89,653	n.a.	n.a.
Preparations of DDT and other toxicants	do	18,767	3,086	19,881	n.a.	n.a.
Petroleum oil sprays (excluding fly sprays and aerosols):						
Oil sprays and emulsions without other toxicants	Gallon	10,849	5,468	11,357	n.a.	n.a.
Oil sprays containing other toxicants	do	1,175	515	1,279	n.a.	n.a.
Other insecticides and fungicides for agricultural use (including nicotine sulfate and organic fungicides)			16,584			[26] 9,814
Insecticides and fungicides, not specified by kind			6,058			

26. See also "Disinfectants".
27. The 1947 data do not include shipments of 9,365 tons of lead arsenate (acid and basic) valued at $3,527,000. The 1939 figure includes data for this basic chemical.
28. The 1947 data do not include shipments of 11,944 tons of calcium arsenate valued at $1,925,000. The 1939 figure includes data for this basic chemical.

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Cotton Insect Conference December 19

THE third annual Cotton Insect Control Conference was scheduled to be held at the Tutwiller Hotel, Birmingham, Alabama, December 19 and 20, with speakers including Ernest Hart, president, National Agricultural Chemicals Association; Claude L. Welsh, director, Division of Production and Marketing, National Cotton Council of America; Clay Lyle, Mississippi State Plant Board; Dr. S. A. Rohwer and F. C. Bishopp, U. S. Dept. of Agri., and Lea S. Hitchner, executive secretary of the N.A.C. Association.

Sessions were to begin early Monday morning with registration, followed with a talk by Ransom E. Aldrich, president of the Mississippi Farm Bureau and chairman of the Production and Marketing Committee of the National Cotton Council. Mr. Welch, Mr. Hart and Dr. Rohwer were to appear after Mr. Aldrich. Title of Mr. Hart's talk was to be "The Chemicals Manufacturer's Relationship to the Cotton Producer," while Dr. Rohwer was to review how cotton insects were controlled in 1949.

Monday afternoon's program was to hear a report on results from cotton insecticides applied as dusts, by F. S. Arant, Alabama Polytechnic Institute; and an open discussion on controlling cotton insects with dusts. Leader of this discussion was to be W. A. Ruffin, Alabama Agricultural Experiment Station.

Equipment for applying insecticides was to be discussed by O. B. Wooten, Jr., Delta Branch Experiment Station; and results obtained from sprayed insecticides were to be reported by E. W. Dunnam, U.S.D.A. entomologist. A discussion on the subject was to be led by Dr. Lyle.

Bishop on Toxicity

J. D. HAYS, vice-president of the Alabama Farm Bureau Federation was to preside at the Tuesday morning session in which Dr. Bishopp was scheduled first to appear. The latter's topic was announced as "Toxicity of Cotton Insecticides and their Harmful Effects." Paul J. Talley, Delta Branch Experiment Station, was scheduled to discuss the chemical control of grasses and weeds in cotton. Tildon Easley, American Cyanamid Co., New York, was on the program to describe the role of defoliation in cotton insect control, and K. P. Ewing, U.S.D.A., was to talk about community action in controlling cotton insects via insecticides.

The question of how adequate supplies and equitable distribution of insecticides may be assured on a national scale, was to be covered by Mr. Hitchner of the N.A.C. Association. The same question, from a local angle, was to be considered by George H. Williamson, manager, Agricultural Sulphur & Chemical Co., Dothan, Alabama. L. M. Sparks, Jr., S. Carolina Agricultural Extension Service, was to discuss the planning and execution of cotton insect control as a guide to producers.

Final session, Tuesday afternoon, was to be under the chairmanship of H. H. Williamson, assistant director, Federal Agricultural Extension Service. F. F. Bondy, U.S.D.A., was scheduled to describe cotton insect control programs for different sized operations, and the final cotton insect control recommendations for 1950 were to be summarized by R. W. Harned, in charge, Division of Cotton Insects, Bureau of Entomology and Plant Quarantine.

The meeting was to end with entomologists of the various cotton states presenting adaptations of the recommendations.

•

Discuss DDT for USP

The proposed inclusion of DDT and other insecticides in the new edition of the United States Pharmacopoeia met with considerable opposition on the part of insecticide and chemical manufacurers at a meeting of the USP revisions committee held November 8th in Philadelphia. The opposition contended that if insecticides were classified as "drugs," they would be subject to complex labeling and other requirements. After considerable discussion, the committee agreed to take care of the problem by providing that the USP references will apply only to products indicated by their titles to be medicinal.

Lea S. Hitchner, executive secretary of the National Agricultural Chemicals Association, Washington, pointed out that if DDT were held to be a drug, its sale, in many states, might be restricted to pharmacist channels. To include economic poisons in the USP, and maintain an exemption from the drug classification would require the printing of the legend "not for drug use" on the label.

In discussing the already numerous burdens of labeling, Mr. Hitchner said "it would certainly be an unwarranted interference with the normal commercial handling and use of a product such as DDT to require the printing of such a legend on the label of product which is not intended for drug use, but which is intended for agricultural and other uses entirely disassociated with the drug field."

Dr. George W. Fiero, Esso Standard Oil Co., speaking for the National Association of Insecticide and Disinfectant Manufacturers, pointed out that the confusion between products intended for insecticidal and medicinal use might be avoided by changing the nomenclature of the two. He suggested that the products listed in the USP be different from the common names of products employed by insecticide manufacturers. For example, dimethyl phthalate, which is a common ingredient of insect repellents, might be called butopyronoxyl solution. He also suggested that the committee delete DDT as synonymous with chlorophenothane, which is listed in the USP.

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Fla. Hort. Society Meets

The Florida State Horticultual Society held its 62nd annual meeting at Tampa, November 1-3. Topics discussed included chemical weed killers, deficiencies of plant nutrients in the soil, nematode control, and application equipment.

N. Central Weed Conf.

The sixth annual meeting of the North Central Weed Control Conference was scheduled to be held at Sioux Falls, S. D., December 6-8, with headquarters at the Cataract Hotel. Topics covering a wide range of weed control problems were scheduled for discussion, beginning Tuesday morning under the chairmanship of R. S. Dunham, St. Paul, Minn., N.C.W.C.C. president.

A. S. Crafts, University of California, Davis, was to discuss the physiology of weed control as a background for considerations to follow, such as the five sessions scheduled for Tuesday afternoon. These included one on "Problems Related to Weed Research," with K. P. Buchholtz, University of Wisconsin, chairman; "Problems Related to Extension," with R. P. Sylwester, Iowa State College, chairman; "Problems Related to Regulatory Activities," E. H. Aicher, Nebraska State Department of Agriculture, chairman; "Problems Related to Aerial Weed Spraying," with F. M. Dosch, South Dakota State College, chairman; and "Problems Related to Industry," with W. A. Harvey, Monsanto Chemical Co., St. Louis, Mo., chairman. An evening session on control of woody plants, was to be held under the chairmanship of L. W. Melander, U.S.D.A., Minneapolis, Minn.

Wednesday morning's schedule was to consist of general sessions under the chairmanship of T. F. Yost, Dept. of Agriculture, Topeka, Kansas. Topics slated for discussion were weed sprayer equipment for field use, by W. P. MacDonald, F. H. Peavy & Co., Minneapolis, Minn; "The Role of Education in the Weed Program," U. J. Norgaard, S. Dakota State College; "Problems of Weed Control Officials," Clyde Spray, Dept. of Agriculture, Des Moines, Iowa.

Two concurrent sessions were on the schedule for Wednesday afternoon. These were to cover weed control in field crops and in horticultural crops. The first section was to be under the chairmanship of F. J. Greaney, Line Elevators Farm Service, Winnipeg, Canada; and the second section was to be in charge of E. K. Alban, Ohio State University, Columbus. The annual banquet was scheduled for Wednesday night.

The final day's program was to include a special showing of exhibits, and a general session under the chairmanship of H. E. Wood, Dept. of Agriculture, Winnipeg, Canada. Weed research was to be discussed by representatives of the U. S. Department of Agriculture, and the place of cultural methods in weed control, by L. M. Stahler, S. Dakota State College. W. G. Loomis, Iowa State College, was to talk on basic studies in weed research to complete the morning session.

C. J. Willard, Ohio State University, was to be in charge of the final session, which was to feature three speakers: R. H. Beatty, American Chemical Paint Co., Ambler, Pa.; B. H. Grigsby, Michigan State College, E. Lansing, Mich.; and R. S. Dunham.

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Sprayers To Meet

A tentative program including at least 18 topics has been set up for the 2nd annual Custom Spray Operators' Training Schol at Urbana, Ill., on January 17-18-19, 1950. H. B. Petty, entomologist in the Illinois College of Agriculture and the Illinois Natural History Survey, program chairman, says at least five ground and airplane operators helped plan the program with a committee from the College. Two evening panel discussions are scheduled, one on problems of ground and the other on problems of airplane operators. Time has been set aside for a business meeting of each group also.

Subjects for Tuesday, January 17 are publicity problems, toxicity of chemicals to the operator and to animals (including parathion, 118, TEPP, 497, toxaphene, chlordane, lindane, DDT, calcium cyanide, 2, 4-D, 2, 4-5 T, etc.), and laws affecting an operator's business. Afternoon topics are phloem necrosis of elms, new equipment and its effectiveness, and supply problems of the manufacturer of agricultural chemicals.

Wednesday's tentative program includes separate reports on control of corn borers, external parasites of livestock, mosquitos, insects in stored grain, insects on legumes, and flies, both on farms and in cities.

On Thursday, January 19, the general subject is weed control. Controlling weeds in corn, soybeans and pastures, pre- and post-emergence sprays, weed laws, brush control, and defoliants are the topics scheduled.

The tentative program is subject to be changed. More than 350 operators from Illinois and nearby states attended the 1949 conference.

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Ohio Group in Meeting

The Ohio Pesticide Institute, Inc., was to hold its annual meeting at the Deshler-Wallick Hotel, Columbus, Ohio, December 1 and 2. All dealers, manufacturers and individuals active in the agricultural chemical field were invited to attend the two-day session. Panel discussions on the use of pesticides, new and old, and a discussion of methods of application were on the program.

DDT IN MILK STUDIED

Scheduled for publication in January issue of "Agricultural Chemicals," is an article reporting tests made to determine amounts of DDT found in milk produced in barns which have been sprayed with DDT insecticides. The paper, prepared by the Geigy Company, Inc., in cooperation with the New Jersey Agricultural Experiment Station, indicates that DDT may be used effectively in dairy barns without milk contamination, if it is applied properly at recommended dosages.

Minnesota Soil Testing Lab.

The state of Minnesota has announced plans for a soil testing laboratory to which farmers may send soil samples for analysis. Reports will cover the acid test, amount of lime and other mineral and organic matter and the texture of the soil and recommendations will be made as to amount and type of fertilizer needed. Paul N. Burson, formerly extension soil specialist at the state college of agriculture, will be charge of this new service.

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IF your're *missing* business you ought to be *getting*, you may not have sufficient TIFA units in your kit of tools.

In your field, TIFA's use is almost universal. This portable, self-powered fog machine is effective for either inside or outside work. It's compact and sturdy —takes rough handling in stride. Its simplicity of operation can save you greatly on manpower and materials.

TIFA distributes your chemicals in a true, clean fog which spreads rapidly . . . adheres to every object . . . penetrates smallest crevices. You'll find TIFA fogs more swiftly, economically and effectively than any other method.

A health necessity in recreational and residential areas, on garbage and fill dumps—an essential tool on farms, ranches and in industry. For satisfied customers—*added* business—put TIFA to work for you today!

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Fog Applicator
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Biological Evaluation of Agricultural and Household Insecticides

Included in our services are: evaluation of proprietary insecticidal materials, determination of the potency of proprietary agricultural dust and spray materials, fungicidal and bactericidal evaluations, warm blooded toxicity studies, and screening of unknown compounds.

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Schroeder to K-M Post

C. L. Schroeder has been appointed sales manager of the Sparklets and Chemical Products Division of Knapp-Monarch, Minneapolis, Minn., the company has announced. He will be responsible for sales of the expanded division which will include

C. L. SCHROEDER

new products such "K-M Magic Mist," insecticide, and "K-M Repellmist," an insect repellent, with other new aerosol products.

Mr. Schroeder has had many years' experience in the chemical and insecticide fields. He was formerly executive vice-president and general sales manager of the McLaughlin-Gormley King Co., and before that was connected with a St. Louis firm in food sales.

•

Air Spraying Discussed

Considerable controversy over the air spraying of insecticides vs its effect on fish and wildlife arose at the second annual short course for aircraft sprayers and dusters at University Farm school, Minneapolis, Minn.

James M. Coutts, associate federal aid supervisor to the fish and wildlife service, pointed out that indiscriminate use of sprayed insecticides will wipe out fish and small game completely. His recommendations to take care of the problem were to control the amount of DDT per acre; provide some means of control to prevent overlapping and concentration of insecticide; and to leave untreated strips for undisturbed sanctuaries.

T. L. Aamodt, state entomologist, pointed out the need for herbicides, since Minnesota farmers alone lose $100,000,000 a year from weeds. He urged a balance between the weed control programs and the fish and wildlife programs.

•

May Change Agri. Div.

Trade reports, which it has been impossible to confirm directly with the company, indicate that Sherwin-Williams may shortly announce plans for sweeping changes in its agricultural chemicals division. It was reported unofficially that the company may abandon a large part of its operations in insecticides and weed killers, while continuing to make and sell certain basic items and perhaps some specialties. Executive supervision of such operations as are retained in this field, it was indicated, many be shifted from Cleveland to New York. A clarifying official statement from the company is looked for shortly.

WRITE, WIRE OR PHONE

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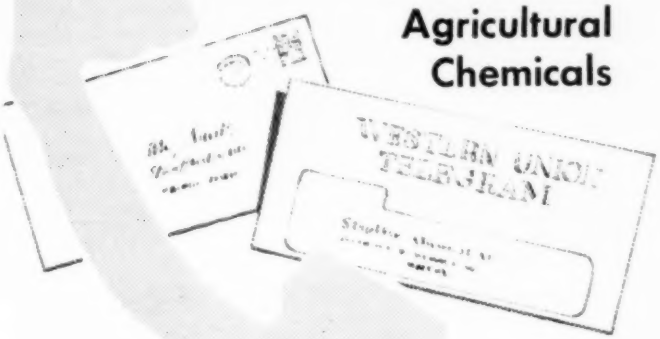
FOR YOUR 1950 BASIC

Agricultural Chemicals



SULPHURS
Spraying—Dusting—Soil
Refined—Crude

DDT
Technical and Concentrates

BHC
Technical and Concentrates

LINDANE
Technical and Concentrates

TOXAPHENE
Wettable, Emulsifiable and Dust Concentrates

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N.A.I.D.M. Changes Name at Meeting in Washington

The National Association of Insecticide and Disinfectant Manufacturers, Inc., was to hold its annual meeting at the Mayflower Hotel, Washington, D. C., December 4 to 6. At this time, the name of the group was to be changed to Chemical Specialties Manufactures Association, Inc., as was voted by the membership at a meeting last June. Five divisions are set up as a part of the general reorganization plan, according to Dr. H. W. Hamilton, secretary of the C.S.M.A.

The program for the Washington meeting was to include the presentation of some 48 papers, specialized discussions covering formulation, manufacturing and marketing problems and an all-day trip to the U. S. Department of Agriculture Plant Research Station at Beltsville, Md. Social events were to include the annual dinner and floor show on Tuesday evening.

New Officers of Eastern Branch AAEE

EDWIN GOULD
Named Branch Chairman

FRANK H. LATHROP
Elected as Vice-Chairman

(See Meeting Report beginning on Page 32)

NW Veg. Insect Conference

The dates of January 3, 4, and 5, 1950, have been selected by the program committee, for the Northwest Vegetable Insect Conference. The meeting is scheduled to be held at the Imperial Hotel, Portland, Oregon.

B. R. Armour Dies at 58

Bernard R. Armour, 58, prominent in chemical circles, died November 30 in New York. Mr. Armour was chairman of the board of directors of American Potash & Chemical Corporation, and was also active in various other corporation-

DDT

2,4-D

Acid, Salt and Isopropyl Ester

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Fertilizer News

Phillips Appoints Prock

ROBERT B. PROCK

Phillips Petroleum Co., Bartlesville, Oklahoma, has announced the appointment of Robert B. Prock as manager of the firm's Los Angeles district fertilizer sales division. Mr. Prock is a graduate from the University of Oklahoma. He worked in Honolulu and joined the U.S. Army quartermaster corps at the start of World War II. He was discharged as a Major in 1945, following which he became a sales representative for a San Francisco firm.

As manager of the Los Angeles sales office, location of which has not yet been selected, Mr. Prock will handle sales of Phillips 66 ammonium sulfate, ammonium nitrate, nitrogen solutions and anyhdrous ammonia.

•

Ill. Farm Fertilizer Plant

Illinois Farm Supply Co., with headquarters at Chicago, has started operations in a new fertilizer plant at East St. Louis, Ill., which has a capacity of about 120 tons of superphosphate and 200 tons of mixed fertilizer per 8-hour shift. The plant was built to give Illinois farmers a source of supply with the least possible movement of inert materials. Products are moved by trailer truck to local outlets. Some 600 farmers attended the open house reception marking inauguration of the project.

Sauchelli Heads ACS Div.

The American Chemical Society has announced that Vincent Sauchelli, director of agricultural research of the Davison Chemical Corp., Baltimore, has been elected chairman of the ACS division of fertilizer chemistry, to succeed Dr. Jackson B. Hester, Campbell Soup Co., Riverton, N.J. Divisional secretary is Dr. S. F. Thornton, director of chemical control and farm service of the F. S. Royster Guano Co., Norfolk, Va. Elected to the division's executive committee were Dr. Firmen E. Bear, chairman of the soils department of Rutgers University; Dr. H. B. Siems, director of research, Swift & Co., Chicago; and C. A. Butt, International Minerals & Chemical Corp., Chicago. Also on the executive committee are the division officers and Dr. Hester.

•

Douglas New Vice-Pres.

St. Regis Paper Company, New York, has recently announced the election of V. C. Douglas as a vice-president of the firm.

Mr. Douglas has been with St. Regis for the past twenty-three years, and for the past twenty years has been manager of the central district of the St. Regis multiwall bag sales division.

V. C. DOUGLAS

•

Canadian Fert. Sales Up

Fertilizer sales in Canada for the 1948-49 fertilizer year increased about eight per cent over the previous year. Industry reports the sale of 602,000 tons of mixed fertilizers.

A. P. F. C. - Grange Award Prizes to Essay Winners

(Photograph Courtesy of American Plant Food Council)

Wilfred M. Schutz, (left) Eustis, Nebraska, was first place national winner in an essay contest on "Conservation of Our Soil Resources" jointly sponsored by the National Grange and American Plant Food Council. Key officials in the presentation ceremonies, made in Washington, October 22, are shown above, left to right: Albert S. Goss, Master of the National Grange; Secretary of Agriculture Charles F. Brannan, who presented the awards to the four national winners as chairman of the Board of Judges, and Clifton A. Woodrum, President of the American Plant Food Council, who presided at the ceremonies.

Secretary of Agriculture Brannan told the audience of Members of Congress, farm leaders, Government officials and representatives of the fertilizer industry that the Grange and Council "rendered a public service, a national service" in making possible the contest, which attracted more than 15,000 entries from young men and women in the 48 States.

Record Fertilizer Exports

The tonnage of fertilizers exported from the United States during August was the highest on record for a single month. Totaling 352,000 short tons, according to a summarization of Census Bureau data by The National Fertilizer Association, August shipments were about 39 percent greater than those during the same month of 1948 and almost twice the quantity recorded for August 1940. The largest single item on the export list—Florida land pebble phosphate rock—accounted for 44 percent of the month's total. Nitrogenous materials and nitrogenous phosphates were also exported in large quantities, showing gains over corresponding year-ago figures of 33,000 tons and 25,000 tons respectively. Potash exports showed no change from those of a year earlier. The value of the August fertilizer exports—$7.6 million—was 23 per cent higher than that of August 1948, lower prices for certain materials and proportionately larger quantities of less expensive materials resulted in a relatively smaller gain in value than in quantity.

•

A & S Appoint Wilson

Henry H. Wilson has been appointed manager of the Cana

HENRY H. WILSON

joharie plant of Arkell and Smiths, Multiwall Bag manufacturers, it was announced recently. Mr. Wilson formerly was with Universal Match Co.

•

Davison Fertilizer Contest

The Davison Chemical Corporation of Baltimore, Md., were hosts in Cincinnati November 12th at the Netherland Plaza to about 75 sales executives and salesmen of its Mixed Fertilizer Division, representing all its plants in the East, South and Midwest. The meeting was held to present what is believed to be the first sales contest for agents ever initiated in the fertilizer business. The Davison contest is designed to boost fertilizer sales during winter and early spring months, thus eliminating production peaks created by seasonal demand. The 1950 spring fertilizer demand, it has been predicted, could exceed the national plant capacity and make it impossible to supply the farmers' requirements."

Davison fertilizer plants are located at Baltimore, Md.; Columbus and Alliance, Ohio; New Albany, Ind.; Perry, Iowa; Nashville, Tenn.; Savannah, Ga.; and New Orleans, La.

Ask the man who uses one..

We Did... and here are just a few of the comments received:

From Kentucky: "We are averaging better than 20 tons per hour with this new unit against our old packing model of 7 tons per hour and we might add we have experienced no difficulty in maintenance other than minor adjustments."

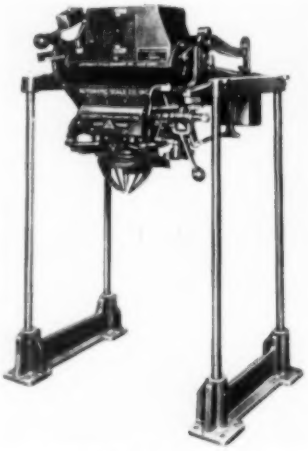
From Tennessee: "We use them in each of our three factories, for both paper and cloth bags, employing a total of fifteen machines."

From Pennsylvania: "We made purchase with the intention of increasing speed and accuracy. Both of these have been accomplished."

From Ohio: "In the past 3 years we have purchased 7 of your Model 515-B Automatic bagging machines. This alone in my opinion, is a very good example of how satisfactory this machine operates."

From Alabama: "Without precedent it is the best scale we have used in the fertilizer business and have tried most of them during the past fifty years."

From Maine: "We have used them for nearly 20 years and the first ones we secured are still in use."



THE NEW 515-B SACKING SCALE

WAS expressly designed for sacking fertilizer. The seasonal nature of the industry, the dust and corrosion make it essential that you have a sacking scale that is fast, accurate, and rugged enough to "take it"; yet so simple that anyone can learn to operate it in a short time. The 515-B will handle any free flowing material.

Some of the features of the 515-B include:

Speeds up to 35 tons per hour on 100 lb bags.
Accuracy—greater percentage of weights correct.
Simplified adjustments to change weights.
Universal all size bag hopper handles any size bag.
Stabilized valve motion.
Automatic valve opening mechanism.
Rugged construction.
Heat treated parts.

Send for further information to

AUTOMATIC SCALE COMPANY, INC.

585 HUDSON STREET NEW YORK 14, N. Y.

Union Bag Names Bradley

Union Bag & Paper Corp., New York, has appointed S. K. Bradley as assistant director of Multiwall Bag Sales. Bradley was formerly

BRADLEY

PATTERSON

Eastern District Sales Manager for Multiwall Bag Sales. His post is being filled by J. J. Patterson, formerly a sales representative.

•

New Plant for Miss.

One of the largest fertilizer plants in Mississippi is now in operation in Canton. The new quarter-million dollar plant was constructed by the farmers' cooperative organization to help remedy the shortage of fertilizers, which has existed for several years. It is expected that the construction of the superphosphate manufacturing unit will result in considerable savings to the members and patrons of the cooperative.

•

Begins Fertilizer Output

The Summers Fertilizer Co., Grand Forks, N. D. is reported recently to have begun manufacturing operations in its new $150,000 plant in Grand Fork, N. D.

•

Two-Day Armour Meeting

Sales and merchandising plans for the coming season were to be outlined by officials of Armour Fertilizer Works at a two-day conference with salesmen at the Stoneleigh Hotel, Dallas, Texas, November 9 and 10. Among those attending the conference were to be C. C. Arledge, general sales manager from the home office in Atlanta, H. G. Wells, head of the "Vertigreen" department, Chan Smith, division sales manager at Dallas, and T. S. Carter of Houston, southwest credit manager. The conference was to be attended by all the firms traveling salesmen from Oklahoma, Arkansas and northern Texas.

Negotiations Resume in N. Mexico Potash Strike

Although the strike in the potash mines in New Mexico was still in effect at press time, negotiations were to be resumed about the middle of December in the hope of settling the tieup affecting three major potash producers: U. S. Potash Co., Potash Company of America, and International Minerals and Chemical Corp., all of whose mines are located in the general area of Carlsbad.

Statements by G. F. Coope, president of the Potash Company of America, and by Paul Speer, of U. S. Potash Company, indicated that Local 415 of the International Union of Mine, Mill and Smelter Workers, which called the strike on November 19, had at last complied with provisions of the Labor-Management Act of 1947 by taking anti-communist affidavits, and that negotiations were now expected to resume. The Federal Labor Relations Board announced on December 8 that the compliance had been made.

The Union's demand for a 25¢ per hour increase in wages was the primary cause for the walkout, industry spokesmen indicated. The three companies held 2-year contracts with the union, which were not to expire until June 1, 1950. The matter of wages was the only open clause in the contract, but upon the Union's calling a strike, the three contracts were cancelled by the companies involved.

New Coast Representative

James Varley & Sons, Inc., St. Louis, have announced the appointment of H. B. Barger as their west coast representative. Mr. Barger will make his headquarters in Portland, Oregon.

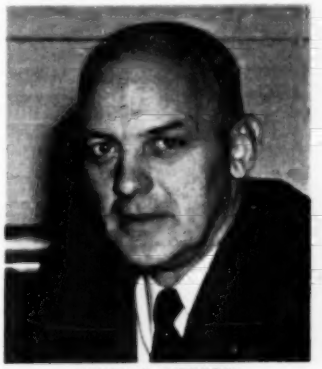
•

W. Colo. Hort. Meeting

The Western Colorado Horticultural Society will hold its 7th annual meeting at Mesa College, Grand Junction, Colo. January 6th and 7th, it has been announced by Wm. H. McKeller, Secretary. Outstanding speakers from many parts of the U. S. are expected to appear.

Heads Dow Chicago Office

Dow Chemical Co. has named Henry S. Pierson as manager of the company's Chicago sales office to succeed Wilson I. Doan, who re-



HENRY S. PIERSON

tires after 31 years of service with the company. Mr. Pierson, a native of Illinois, has been with Dow since 1938. He studied law at Washington University, St. Louis, Mo., and was admitted to the Missouri Bar in 1925.

Mr. Doan has been with Dow since 1918. He opened the firm's St. Louis sales office where he served as manager until he opened the Chicago office in 1937. Both Mr. Pierson and Mr. Doan are active in professional and civic organizations, and are well known in chemical circles.

•

Hopper Campaign Results

Results from last summer's spraying and baiting program to control the tremendous grasshopper infestation in the mid-west are still being tabulated. The American Aircraft Association reports that over five hundred billion grasshoppers were wiped out, the dead grasshoppers weighing an estimated 175,000 tons. Three government planes and thirty-seven others operated by custom sprayers distributed poison baits over an area of 2,700,000 acres in a little over two weeks. David Hall, USDA entomologist in charge of the project, estimated that the program saved approximately half the grass in the area. Long distance migration of grasshoppers was also halted, thus forestalling outbreaks in new areas.

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PYROPHYLLITE

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PHYLLITE'S UNIFORMITY IS UNSURPASSED

A chemical analysis run consistent in every batch of PHYLLITE assures the insecticide manufacturer of absolute uniformity for use as a diluent and carrier. PHYLLITE is ground in a Raymond Mill—95% through 325 mesh. Has low pH (5.1).

IMMEDIATELY AVAILABLE

- *Write us for helpful information and a generous sample.*
- *Packed in 50 lb. valve bags. 20 ton lots. Lowest prices on West Coast. F.O.B. plant.*
- *Smaller quantities if desired.*

PIONEER PYROPHYLLITE PRODUCERS

HANCOCK 2-2992
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CHULA VISTA, CALIF.

PARIS GREEN

Dow Chemical Co. Brand

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Carload and L.C.L. Quotations on request

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TeeJet
SPRAY NOZZLES

The Spray Nozzles Manufacturers Prefer

TEEJET FEATURES

- Orifice tips and strainers interchangeable without removing body from Boom. Capacities for every application.
- Flats on tip parallel to direction of spray for easy nozzle adjustments.
- Patented TeeJet "lap edge" spray pattern. Equalizes spray distribution of boom... minimizes problem of over-application or missed-areas when boom tilts due to uneven ground.
- Uniform particle size for coverage with minimum driftage.
- Patented V is also tip protects nozzle opening against accidental bumping.
- Precision construction throughout to make sure that good engineering design is maintained in the manufactured product.

For Weed Killing, many types of plant pest control, and numerous other farm spraying operations . . . TeeJet Spray Nozzles give the spray uniformity and degree of atomization needed for low cost, effective spraying. TeeJet nozzles are proved in the engineering laboratory and proved in the field.

Get all the facts now . . . see for yourself why the TeeJet line is preferred in its field among spraying equipment manufacturers everywhere. Write for Bulletin 55 . . . describes TeeJet Nozzles and assessory fittings.

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3230 RANDOLPH St., BELLWOOD, ILL.
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STANDARD EQUIPMENT ON AMERICA'S LEADING SPRAY RIGS AND SPRAYERS

Have You a DUST BLENDING PROBLEM?

Our Engineers will be glad to help you to solve any mixing or blending problem you many have.

SPECIALISTS in INSECTICIDE DUST BLENDING EQUIPMENT

★ Address Inquiries to . . . ★

The YOUNG MACHINERY COMPANY

MUNCY PENNSYLVANIA

OIT Asks Fertilizer Data

The Office of International Trade has asked major producers of fertilizers to report on the possible availability of domestic surpluses of nitrogen fertilizers during the coming nine month period. Export licensing officials are anxious to determine whether there is a prospect of their being able to increase export quotas without cutting the domestic supply. Virtually all the 82,000 tons of nitrogen export quota for 1950 is reported to have been licensed.

Phillips Petroleum Co., operators of the Cactus Ordnance Works, have filed a formal request for a 60,000 ton increase in the current year's export quota for shipment after January 1. The company's productive capacity will be doubled, it is reported, reaching an annual rate of 120,000 tons as a result of installation of a second train at the Cactus plant, expected to be completed in December. The position of the Phillips Company is reported to be that increased domestic production of nitrogen will create a surplus early in 1950, and that because it got into production too late to make domestic sales contracts, it must find expanded export markets.

•

Army Fertilizer Contracts

Ammonium sulfate and ammoniated superphosphate contracts in excess of $100,000 were signed recently by the Army Field Director, Ammunition Plants, Joliet Ill. Phillips Chemical Co., Bartlesville, Okla., will supply 40,000 tons of the sulfate for $1,729,400; Mathieson Chemical Corp., New York, will supply 10,000 tons of sulfate for $191,100 and 16,400 tons of the superphosphate for $282,080. Best Fertilizers Co., Oakland, Calif., will supply 10,000 tons of sulfate for $197,500. Superphosphate contracts call for 33,600 tons from H. J. Baker and Bros., New York, for $590,576.

•

Adds Another Mfg. Unit

The Best Fertilizers Co. Oakland, Calif., has installed a fifth production unit at the synthetic ammonium sulfate plant, acquired recently in Baltimore. The plant is now producing fertilizer material for the general trade and government account.

•

Early Buying Is Urged

Dr. Russell Coleman, president of the National Fertilizer Association, Washington, D. C., has written the editor of *Agricultural Chemicals* to emphasize the importance of buying 1950 fertilizers as soon as possible.

"It is now widely said that there will be adequate supplies of fertilizer for everyone in the year ahead," he writes. "Unfortunately, the facts do not unqualifiedly support this. The facilities for the production of the basic fertilizer materials, although adequate to meet current needs, have not been able to operate at full capacity. This has been largely due to the delay of farmers in ordering and moving their fertilizers. Any further postponement in the plant-to-farm movement of fertilizers, coupled with the limited storage capacity in the plants, may make it impossible for manufacturers to produce the kinds and amounts of fertilizers needed on the farms in time for the spring planting season.

"The present strike in mines has also restricted the movement of potash materials and if this strike continues long, it will seriously affect the production and distribution of fertilizers," Dr. Coleman stated.

(The fact that negotiations were to be resumed immediately between the striking CIO Union and the three affected companies, is reported on page 65. The strike has been in progress since November 19.)—Ed.

•

Potash Co. Building Plant

The Potash Co. of America will build a new million dollar plant for the production of potassium sulphate and hydrochloric acid near Carlsbad, New Mexico. The company completed, recently, a four-million dollar plant expansion program to increase the output of 60 per cent muriate.

Arkell & Smiths Observe 90th Birthday

Arkell & Smiths, paper bag manufacturers, celebrated their recent 90th anniversary with an "open house" in their two paper bag plants at Canajoharie, N. Y. Several thousands of people toured the two plants to view the modern bag-making machines in operation. On display were the original bag tubing and bottoming models and patents which were issued to James Arkell in years past. Many current machines used in the industry are adaptations of the principles established by Mr. Arkell, who was granted 32 patents in all. Similar 90th anniversary celebrations and open houses are being scheduled for other A&S plants at Wellsburg, W. Va. and Mobile Ala.

LABEL REQUIREMENTS

(*Continued from Page 41*)

mist. Do not leave in eyes, on skin or on clothing. Wash thoroughly. Avoid contamination of feed and foodstuffs.

Solutions and emulsions.

Since various solvents which differ in toxic properties may be used, labels should bear the combined hazards of Toxaphene and the solvent.

(67) 2, 4, 5-trichlorophenoxyacetic acid —Salts—20 percent and above.

Caution: Avoid inhaling dust. Avoid contact with skin, eyes or clothing.

Esters—20 percent and above.

Caution: Avoid contact with skin, eyes or clothing.

Note: Added warning statements regarding danger to crops through drifting dusts or sprays, should be used on all labels of 2, 4, 5-T formulations

(68) Zinc dimethyl dithiocarbamate; any effective concentration.

Caution: May Be Harmful if Swallowed or Inhaled! May cause irritation of nose throat and skin. Avoid contact with eyes, skin or clothing. Avoid breathing dust or spray mist. In case of contact, flush with plenty of water. For eyes, get medical attention.

Fire Hazard: For dust mixtures 50 percent and above. Keep away from fire and sparks.

(69) Zinc ethylene bis-dithiocarbamate —10 percent and above.

Caution: May Cause Irritation of Nose and Throat! Do not breathe dust or spray mist.

Fire Hazard: For dust mixtures 50 percent and above. Keep away from fire and sparks.

In addition to the materials listed above, the U.S.D.A. announcement also contained label requirements for the following materials:

Acetone, (50 percent and over), acrylonitrile, antimony potassium tartrate, (10 percent and above), azobenzene, barium carbonate (10 percent and over), benzene, 15 percent and above, borax and boric acid (20 percent and above), cadmium formulations (each to be considered on own merits—if found "highly toxic" under the Act), calcium cyanamide (25 percent and above), chloroform, (10 percent and above), chloropicrin, (any effective concentration), coaltar creosote (containing less than 5 percent phenols), coaltar disinfectants, cyanide—calcium cyanide (5 percent and above), copper compounds (10 percent and above, based on the percentage of elemental copper present),

Dichloroethyl ether (10 percent and above), dinitro ortho cresol (10 percent and above), di-(p-chorophenyl) methyl carbinol (25 percent and above), ethyl bromide (10 percent and above), ethylene dibromide (10 percent and above), ethylene dichloride (10 percent and above), ferric dimethyl dithiocarbamate (any effective concentration), formaldehyde solutions (4 percent and above), Hydrochloric acid (10 percent and above, as hydrogen chloride), hypochlorites (sodium and potassium hypochlorite solutions, 10 percent and above), and kerosene sprays.

Mercury compounds—inorganic salts (except calomel, 20 per cent and above, based on the percentage of elemental mercury present), mercury metallic (in ointments, 20 percent and above), methyl bromide, methylene chloride, nitrobenzene (oil of mirbane, 25 percent and above), orthodichlorobenzene (10 percent and above), paints, containing DDT, DDD, chlordane, BHC or toxaphene, pentachlorophenol (except oil solutions or emulsions, 5 percent and above), phenols (including phenols, cresols, cresylic acid, 10 percent and above), phosphorus (white or yellow, 1 percent and above), pine oil disinfectants, quaternary ammonium salts —2 percent and above, alkyl ($C_6H_5C_7H_6$) dimethyl benzyl ammonium chloride, alkyl trimethyl ammonium bromide and allied substances, zinc phosphide (10 percent and above) and zinc salts (considered as zinc, not as anions—5 percent and above.)

CFA MEETS

(*Continued from Page 37*)

toward better and closer cooperation along educational lines, and more accurate information and acceptance of this information as developed.

Dr. Russell Coleman, president of the National Fertilizer Association, Washington, D.C., followed the panel. He spoke on "The New Look in Fertilizers," presenting a graphic picture of the fertilizer industry's evolution. He traced its growth up to the present, pointing out how the industry has attained maturity and is a vital part of our economy. The NFA head emphasized that there is still a job to be done. "We must convince the consumer that fertilizer is as vital as coal, steel and electricity," he declared.

Dr. H. B. Siems, Swift & Co., Chicago, chairman of the NFA Plant Food Research Committee, concluded the program by presenting an animated talk on fertilizer elements to the crowd. Taking the part of a "chef of chemistry," Dr. Siems used actual chemicals, retort tubes and other paraphernalia to illustrate his points.

A banquet Tuesday night and an industry luncheon were also highlights of the convention. The banquet's after-dinner program was in charge of George Bloxham, and Weller Noble, Pacific Guano Co., Berkeley, Calif., was toastmaster. Elmer S. Nelson was the speaker at the luncheon. Discussing the general theme of the economic trend and the fertilizer industry, he reviewed business events of the past decade which point to continuing prosperity. "American agriculture has attained a measure of stability which has the effect of stabilizing the fertilizer industry," he said, and added that this situation assures the future of both. The CFA executive forsaw a significant increase in west coast population, which in turn will increase the need for more food.

HEARINGS

(*Continued from Page 24*)

the commercial production of a crop, its use would be a "practical necessity" within the meaning of this report. Assume that without the use of insecticides, an acre of land will yield 326 pounds of cotton but by the use of a particular insecticide, that same acre will yield 567 pounds of cotton.[21] Under a strict interpretation of section 406, it could not be said that the use of this insecticide is "required" in the production of cotton. Can it be doubted, however, that in the commercial production of cotton, its use or the use of some similar insecticide would be a "practical necessity."

Assume, again, that without the use of any insecticide, 7% of the walnuts produced on a certain piece of land will be damaged by the coddling moth. By the use of DDT, this same land would yield walnuts only 0.13% of which would be damaged by the coddling moth. (See 21, ante.) It is submitted that as a "practical necessity," the use of DDT would be required if the commercial production of sound fruit could thereby be increased by approximately 6%.

What Decisions Can Be Anticipated

THERE has been some question whether the Food and Drug Administration might adopt the view that there is one specific insecticide which is safe for use on each specific fresh fruit or vegetable and that,

21. See Table I, "How Pest Control Programs Affect Residues in Food" by W. M. Hoskins, Vol. IV, No. 10, *Agricultural Chemicals*, October 1949, p. 23.

therefore, the use of no other insecticide is required. It would seem that practical considerations alone would be sufficient to preclude the adoption of a control program based upon the use of only one insecticide. Supply of and demand for insecticidal materials are too variable. The development of insecticide resistant insects might soon make any such control program useless. It would also overlook the necessity of using a combination of different economic poisons on the same fruit or vegetable to give over-all control of all insects and plant diseases.

In my opinion, any insecticide which will give the required entomological control and leave a residue which is within safe limits should be entitled to inclusion in the regulations. For this reason, evidence relating to relative costs, or relative entomological efficiency of competing economic poisons, will not, in my opinion, be material or relevant. It is my belief that the interjection of these elements into the hearing, and an effort to promulgate a narrow control program by legislative fiat would hopelessly mire in impracticability the control and use of these products.

The determinations discussed above of whether a particular product is "poisonous or deleterious" and if so whether it is "required" in the production of specific fruits and vegetables must be made for each product which comes within the scope of the hearing. There are, of course, many other points on which a finding of fact will be necessary. Each interested party must determine the legal principles which in its opinion, will apply to its product. Evidence should be introduced to support a finding of fact on each pivotal point upon which these legal principles rest.

There are numerous other questions of procedure with which a party participating in the hearing will be faced. The statutory provisions discussed generally above do impose certain restrictions upon both the subject matter and method of presentation of evidence—restrictions which at the same time are safeguards. Unfortunately there have been a few instances in the past when parties were not aware of these restrictions or requirements until they were ready to present their testimony. Any party intending to participate in the hearings would be well advised to seek the advice of competent counsel in the preparation of its case.

This proceeding places a heavy responsibility upon the producers of economic poisons, the fruit and vegetable grower as the consumer of those products, and the Food and Drug Administration. The job of writing regulations which will permit flexibility in the use of the many efficient economic poisons now being produced, as conditions dictate from time to time and from place to place, in the production of an ample supply of fruit and vegetables, and which will at the same time assure adequate protection to the consumer, is admittedly a Herculean task. It cannot be done without the constructive cooperation of each of these groups. Upon this cooperation and the outcome of these hearings will depend the future pattern of control and use of these products.

FUNGICIDE TESTS

(*Continued from Page 47*)

a small segment of sterile agar was inserted into each incision. These fruits were held as controls. In like manner, five peaches were inoculated with each of the three isolates used in the previous experminent and five with a recent isolate of the same fungus from a lupine seed. A small segment of agar from a vigorous culture of the isolate was substituted in each case for the sterile agar used in the controls. The point of inoculation was encircled with a moistened indelible pencil. The fruits were then held in moist chambers at room temperature. The controls were all healthy on June 27, whereas all inoculated fruit had typical anthracnose lesions two to three cm in diameter at the point of inoculations. The fungus was reisolated from the lesions.

The results of the above experiments demonstrate that the isolates of *Glomerella cingulato* from lupine and peach were capable of attacking both hosts. The extent of the damage that may result from growing a winter cover crop of lupine on or near a peach orchard is not known. The lupine, when used for green manure, is usually turned under in April or May, but when permitted to mature, seed is ready for harvest in late May or June. Anthracnose is most conspicuous on lupine stems and pods as they approach maturity, although seedlings also may be killed. The presence of an abundance of spores on or near a peach orchard a short time before harvest would seem to be a potential danger to the fruit, either in the orchard, in transit, or on the market. Likewise, the presence of diseased fruit left in the orchard in July may constitute a menace to the lupine crop planted in October. Although at present no correlation between the amount of anthracnose in a peach orchard and the proximity of a lupine field has been shown, until more observations can be made it would seem wise to be cautious about planting lupines in peach orchards in sections where anthracnose is known to be present on either crop.

JAP BEETLES

(*Continued from Page 47*)

of Arizona.

The potato leafhopper was reported as unusually abundant in Florida, where beans in the Sanford district and cowpeas in the Homestead district were being injured. Potatoes were being attacked in the Norfolk district of Virginia. Lygus bugs caused serious damage to lima beans in southern California and moderate infestations on carrots and lettuce were reported from South Carolina.

Cabbage caterpillars were present in moderate to heavy populations throughout the month on cabbage and related crops in parts of Virginia, Georgia, Florida, Alabama, and Texas. They occurred in slightly lesser numbers in South Carolina and California.

Infestations of aphids on cabbage and related crops were reported from New Jersey, Virginia, South Carolina, Georgia, Florida, Alabama, Louisiana, and California in numbers varying from light to heavy.

On alfalfa and clover in southern Wisconsin, the pea aphid was reported as more abundant than usual at this time of the year. A light infestation on peas was reported from southern California. The vegetable weevil has become active in vegetable gardens in Florence County, S. C., central Georgia, and the Baton Rouge district of Louisiana.

The Hawaiian beet webworm was reported during the latter part of October as causing severe damage to spinach in eastern Virginia, and the fall armyworm was abundant on various vegetables in Florida and in the Rio Grande Valley of Texas.

•

Com. Solvents Builds Plant

A new insecticide plant for the large-scale production of Lindane, the pure gamma isomer of benzene hexachloride, is to be constructed at Terre Haute, Indiana, it was announced last month by Commercial Solvents Corp., New York. The Lindane production unit will be located adjacent to the present benzene hexachloride plant and will utilize the latter's production of technical grade material for the extraction of the gamma isomer. The present plant is to be expanded to effect an estimated increase in production of twenty-five percent and will permit the continued marketing of the technical product. The insecticide projects are estimated to cost about $500,000.

It is expected that expansion of the present benzene hexachloride plant will be completed within six months, while large-scale production of Lindane will be under way within a year.

•

Gardner Calspray V.P.

Leo R. Gardner, a member of the board of directors of California Spray-Chemical Corp. for many years and manager of the research and development department since January, 1948, has just been named vice-president of the company. Mr. Gardner joined the company in 1926 and started the research laboratory at San Dimas, Calif., under the direction of H. W. Volck. He then entered the foreign field, serving in Europe, Asia and Africa for over seven years. Mr. Gardner became research coordinator in 1938, later director of research.

SULFUR & LIFE

(*Continued from Page 27*)

has recently been accorded increasing attention. Lipman attempted to strike a balance and to determine whether in the normal course of events the sulfur supplies in the soil were augmented or depleted.

Roughly speaking, the sulfur removed by cultivated crops and grasses is compensated for by applications of animal manure and commercial fertilizers. But due to the ever-increasing use of tractor power, the supplies of barnyard manure returned to cultivated land have diminished considerably. Some sulfur is

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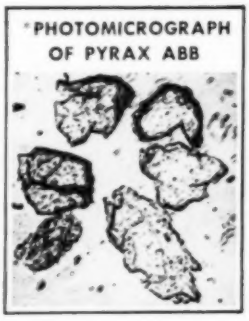
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added from the atmosphere by rain and snow. Some is added to soils in irrigated regions by the irrigation water. But taking all of these additions into consideration, and balancing them against sulfur losses due to leaching, drainage, erosion and removal by crops, Lipman came to the conclusion that the sulfur supplies in the soil are gradually being depleted. According to his data the land in cultivation in the United States including the areas given to crop production, to pastures and to woodland grazing, annually loses about one million tons of sulfur. He then asks "whether the more or less far-reaching changes coming into our fertilizer industry, coupled with the crop intensification program which must become a part of our new agriculture, may not justify a careful study of our plant-food resources."

Summary

It was eighteen years ago when Lipman suggested a reappraisal of the role of sulfur in agriculture. Since that time considerable new information has been obtained regarding the role of sulfur in soil fertility, plant nutrition and the well-being of humans and animals. A great advance was made in our knowledge regarding the place of sulfur in agriculture when Hart and Peterson applied new research techniques to the problem and showed that our former concept regarding the sulfur content of plants was all wrong. Today again new techniques are being applied to the problem. These involve the use of radioactive sulfur and tracer materials. New and important information is being uncovered with regard to the fate of sulfur in the soil as related to changes induced by micro-organisms and chemical reactions. It is believed that that these new techniques will greatly advance our knowledge regarding the function of sulfur in soil fertility, plant and human nutrition and human well-being. Perhaps these new techniques will give us a better appreciation of the place and function of sulfur in the cycle of life.

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Velsicol Names Weldon

George Weldon has been appointed west coast representative of the chlordane division of the Velsicol Corporation, Chicago, according to

GEORGE WELDON

David W. Lynch, sales manager. Mr. Weldon will be stationed in Pomona, Calif., where he has made his home for the past three years. The appointee is a graduate in entomology from Oregon State College, and he later took his Master's degree from Michigan State.

•

Armour Offers Emulsifier

Armour Chemical Division, Chicago, Ill., has developed a new cationic emulsifier for chlordane and other agricultural insecticides. The product, known as "Arquad 2C" produces either stable or quick-breaking emulsions. The material is used in much lower concentrations than other commonly-used emulsifiers, the makers state. "Arquad 2C" is described as an oil soluble quaternary ammonium compound with good surface active properties. It displays the characteristic of acting as a "surface oiling" agent, bonding the oil phase to surfaces contacted by the emulsion.

•

Offers Sequestering Agent

Chas. Pfizer & Co., Inc., Brooklyn, N.Y., have announced the use of citric acid as an "economical and stable" sequestering agent to prevent the precipitation of 2,4-D salts by hard water. Preparation of 2,4-D amine salt concentrates has become quite general, the company points out, but when used in hard water areas, a heavy precipitate forms upon dilution. Approximately ¾ ozs. of citric acid per pound of 2,4-D included in the concentrate will protect against precipitation in water of 1,000 p.p.m. hardness, with proportionately larger quantities necessary for harder waters, it is explained by the makers.

NFA MEETING

(*Continued from Page 30*)

story may be developed on the farm, handed down from father to son; that experiment stations tell the story, and that it is also heralded in various publications and on the radio. He said that the old-time agriculturist is almost a thing of the past in this day of specialization. By this token, he said, it is more difficult for one to see the picture as a whole, since individuals are interested particularly only in certain phases of it.

Mr. Nunn said that the three million farm people in the south are in need of hearing the story, and that some 35 million urban families should also hear it in order to have a proper understanding of the problems involved. Farm publications have many millions of potential readers, he reminded, and radio and newspapers add to the total. The subject of soil improvement is one of universal interest, he pointed out, tending to bring all classes of people together. He emphasized, however, the necessity of "pushing along" the average farmer, since he tends to dislike altering his usual methods of doing things. Dramatization of the story was recommended as one of the best methods of putting it across.

Mr. Eleazer stressed the role of science in demonstrating the better ways of farm management, but reminded that the farmer must continue to earn while the transition between the old and the new is taking place. He warned against going too far, too fast. He highly commended the use of fertilizer for taking the south out of the "short grass" category, pointing out that grass has changed from the "mortal enemy" of the south, to a new role of friend.

Mr. Cope recommended the use of radio to reach the lower levels of farm mentality, since many of the growers do not bother to read. He emphasized that the land, even "the red soil of the south," can be made to live again; that the feeding value of grass may be increased via fertilization; and that many bankers and suppliers of fertilizers and other farm supplies know too little about the over-all problems of farmers. He advocated a general education for every one in the field in order that the total story may be put across.

Perhaps the outstanding social event of the convention was a barbeque given by Asheraft-Wilkinson Co., Atlanta, for the NFA members and guests at the Druid Hills Golf Club Monday night. Special buses transported the entire group to the scene.

Also bringing forth a considerable amount of favorable comment was the showing of the new NFA sound and color film, New England's Green Pastures," as part of the program.

N. E. WEED CONF.

(*Continued from Page 43*)

Davis and Ora Smith, Cornell University, will present "Physiological Studies of the Toxicity of 2, 4-D"; J. L. King, Boyce Thompson Institute, will report findings on "Dichloral Urea (E.H.2) and sodium 2, 4-D Sulfate (E.H.1) as Selective Herbicides"; and Robert F. Carlson, Michigan State College will talk about specific uses of IPC on certain weeds in horticultural crops.

A report on weed control with chemicals in the tropics will be given by Ora Smith and J. R. Orsingo, Cornell University; "Experiments with Potassium Cyanate and Calcium Cyanamide on New Jersey Asparagus, 1949," S. B. LeCompt, Jr., Rutgers University; and "Effects of Some Herbicides on Strawberry Plants of Various Varieties," by Dale E. Wolf and F. A. Gilbert, Rutgers Univ., will be presented also.

The afternoon of Wednesday is slated to hear more reports on weed

control. These include "Influence of Irrigation and Time of Treatment Application on Pre-Emergence Weeding," by Dr. Sweet and S. L. Dallyn, Cornell University; "Equipment for Applying Herbicide Sprays to Weeds in Row Crops" by C. W. Terry and Drs. Sweet and Dallyn, and G. M. Taylor, Cornell University; and "A Progress Report on Chemical Weed Control in Asparagus, Lima Beans, Cantaloupes, Potatoes and Sweet Corn," by E. M. Rahn and W. L. Ogle, University of Delaware.

"Chemical Weed Control in Sweet Corn, Spinach, Asparagus and Other Vegetable Crops," by C. J. Noll and M. L. Odland, Pennsylvania State College; "Weeding Corn with Chemicals," by Wm. H. Lachman, Massachusetts State College and "Chemical Control of Wild Mustard in Canning Peas and Its Effect on Productivity," by C. H. Dearborn, New York Agri. Experiment Station are also on the agenda for Wednesday afternoon.

A concurrent session on Agronomic Crops: Turf, will be under the chairmanship of S. W. Raleigh, Pennsylvania State College. Among the authors scheduled to present papers at this session are J. Stanley Cobb, S. W. Raleigh, and R. E. Patterson, Pennsylvania State College; J. Howard Ellison, Walter C. Jacob, Ora Smith, E. C. Nutter and J. F. Cornman, Cornell University; Glenn C. Klingman, North Carolina State College; Leland G. Butler, Dale E. Wolf, G. H. Ahlgren, Charles S. Gould, Earl E. Walter, and Ralph E. Engle, Rutgers University; F. B. Muller, T. E. Odland, and J. A. LeFrance, Rhode Island State College; A. J. Tafuro and J. D. Van Geluwe, G.L.F., Ithaca, N. Y.; Homer B. Neville, Long Island Agricultural and Technical Institute, Farmingdale, L. I.; and Fred B. Grau, U.S.D.A., Beltsville, Md.

A concurrent session on Public Health is to be held also on Wednesday afternoon. Chairman of this portion of the program is A. H. Fletcher, New Jersey Department of Health.

The annual banquet will be held on Wednesday night, with the main speaker being Dr. Philip V. Cardon, Administrator of the Agricultural Research Administration, Washington, D. C. Dr. Cardon's topic has not been announced.

An evening session on the control of weedy plants is to begin at 9 p.m., Wednesday. Among the speakers scheduled for this evening program, presided over by Dr. A. M. S. Pridham, Cornell University, are: L. L. Coulter, Dow Chemical Co.; F. E. Egler, Norfolk, Conn.; W. C. Bramble and D. P. Worley, Pennsylvania State College; H. H. Iurka, Babylon, N. Y.; H. B. Neville, L. I. Agricultural and Technical Institute; F. S. Spon, Pacific Coast Borax Co.; E. J. Eliason, Saratoga Tree Nursery; and P. W. Zimmerman and A. E. Hitchcock, Boyce Thompson Institute for Plant Research.

Thursday morning's session will be in the form of a business meeting under the chairmanship of Dr. Sweet. At noon the Coordinating Committee will meet, with Dr. W. G. Jacob, Cornell University, as moderator.

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Industry Patents

2,485,095. Insecticides. Patent issued October 18, 1949, to Walter D. Harris, Naugatuck, and Herman D. Tate, Woodbridge, Conn., assignors to United States Rubber Co., New York. A beta-monohaloethyl ester of a monohalogenated benzenesulfonic acid selected from the group consisting of beta-chloroethyl esters and beta-bromoethyl esters of meta- and para- chlorobenzene and meta- and para-bromobenzene and meta- and para- fluobenzene sulfonic acids.

2,485,203. Urea- Formaldehyde Compositions. Patent issued October 18, 1949, to H. M. Kvalnes and Franklin S. Chance, Wilmington, Del., assignors to E. I. duPont de Nemours & Co., Wilmington. A liquid composition comprising a urea-formaldehyde reaction product obtained by heating urea with from 4 to 5 mols of formaldehyde per mol of urea in alkaline aqueous solution followed by removal of water from the reaction mixture at 100° F. to 200° F. under subatmospheric pressure, the said water-removal step being carried out at a pH of 5 to 6.8, whereby a urea-formaldehyde reaction product comprising dimethyloluron is formed, said urea-formaldehyde reaction product having a mol ratio of free and combined formaldehyde to free and combined urea within the range of 2.5:1 to 4.0:1, admixed with a compound of the formula

$$NH_2CNH_2$$
$$\parallel$$
$$X$$

X being a member of the class consisting of oxygen and sulfur, in such proportions that the mol ratio of free and combined formaldehyde to free and combined NH_2CNH_2 $\parallel$ X in the resulting mixture is from 1:1 to 1.3:1.

2,485,256. Manufacture of quaternary nitrogen compounds. Patent issued October 18, 1949, to Aart Buurman, Velp, Netherlands, assignor to American Enka Corporation, Enka, N.C. A process for the preparation of higher molecular quaternary pyridinium chlorides and homologues thereof which comprises mixing, as initial reactants, an alkyl chloride having at least eight carbon atoms and a heterocyclic tertiary amine, in an autoclave containing at least 20% water based on the total weight of the mixture, and heating this aqueous mixture, consisting essentially of said reactants, to an elevated temperature and under an increased pressure to effect a direct reaction between the chloride and amine, and finally purifying the reaction product.

2,485,330. Fungicidal Compositions. Patent issued October 18, 1949, to Wm. D. Stuart and J. H. Standen, Yonkers, N. Y., assignors to the B. F. Goodrich Co., New York. A method of protecting materials which are capable of nourishing fungi from destruction by fungi which comprises bringing the material into contact with a thiothiazyl ether having the formula

$$R-S-C_nH_{2n}-O-C_nH_{2n}-X$$

where R is a thiazyl radical, X is a halogen and n is an integer from 2 to 4.

2,485,339. Aqueous Fungicidal Dispersions of Salicylanilide. Patent issued October 18, 1949, to Willem van Eijk, Amsterdam, Netherlands, assignor to Nederlandsche Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands. A method of preparing an aqueous fungicidal dispersion containing salicylanilide in very finely dispersed form, which comprises melting salicylanilide with an emulsifying agent that lowers the melting point of the salicylanilide to obtain a molten composition miscible with water in liquid phase, and then thoroughly dispersing said composition in molten state in an aqueous liquid medium at a temperature below the melting point of salicylanilide.

2,485,605. Grain Fumigant. Patent issued October 25, 1949, to Jonas Kaulet, New York, assignor to Publicker Industries, Inc., Philadelphia. A method for controlling insects and related parasites in stored grain, seeds and milled food products, comprising spraying a liquid containing crotyl chloride on the surface of the stored material.

2,485,987. Aminodioxanes as Insecticides. Patent issued October 25, 1949, to Murray Senkus, Terre Haute, Ind., assignor to Commercial Solvents Corp., Terre Haute, Ind. An insecticidal composition comprising an inert carrier liquid and, as an essential active ingredient, from about 4 to 7 per cent by weight of a 5-amino-1,3-dioxane having the following structural formula:

in which R represents an alkyl group of from 1 to 2 carbon atoms, R^1 represents substituents selected from the group consisting of hydrogen and methyl, and R^2 represents a substituent selected from the class consisting of hydrogen, an alkyl group having in excess of 2 carbon atoms, and an alkenyl group.

Trade Mark Applications

SUPER-GERMITE, in heavy capital letters, for chemical preparation for use as a larval spray. Filed Mar. 15, 1948, by Standard Oil Co. of California, San Francisco. Claims use since December, 1933.

BUTOX, in capital letters for spray type liquid insecticide. Filed Sept. 30, 1948, by Nash & Kinsella Laboratories, Inc., St. Louis, Mo. Claims use since Apr. 14, 1948.

SPIRITTINE, in hand-lettered caps and lower case, for insecticides. Filed Mar. 24, 1948, by Spirittine Chemical Co., Wilmington, N. C. Claims use since 1900.

Drawing of shell, for soil fumigant. Filed June 15, 1948, by Shell Chemical Corp., New York. Claims use since Jan. 30, 1948.

MISSION BRAND, in arc-shaped capital letter arrangement, for fertilizers and soil sulfur. Filed Aug. 23, 1948, by Hayes-Sammons Co., Mission, Texas. Claims use since Aug. 22, 1934.

TEXSUN, in hand-lettered capitals, for fertilizers and soil sulfur. Filed Aug. 23, 1948, by Hayes-Sammons Co., Mission, Texas. Claims use since Aug. 17, 1948.

Drawing of black cat with arched back, for fertilizer. Filed Feb. 1, 1949, by Minden Cotton Oil & Ice Co., Ltd., Minden, La. Claims use since Nov. 1946.

FUR-AG, in capital letters, for furfural residue used as a conditioner in mixed fertilizers. Filed Mar. 14, 1949, by Quaker Oats Co., Chicago. Claims use since Oct. 30, 1948.

WHITE DIAMOND, in hand-lettered capitals within drawing of diamond from which extend radiating white lines, for fertilizers. Filed Mar. 26, 1949, by Southern Acid & Sulphur Co., St. Louis, Mo., assignor to Mathieson Chemical Corp., New York. Claims use since February, 1902.

SASCO, hand-lettered outline capital letters within oval, for sulfur in powder and granulated form for fertilizers used in agriculture as plant food. Filed Mar. 26, 1949, by Southern Acid & Sulphur Co., Inc., St. Louis, Mo., assignor to Mathieson Chemical Corp., New York. Claims use since 1945.

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Potash Deliveries Reported

The American Potash Institute, Washington, D.C., has reported that the five major American potash producers delivered 501,530 tons of potash salts containing an equivalent of 276,211 tons of K_2O during the third quarter of 1949, a decrease of 2 percent in salts and an increase of 2 percent in K_2O over the same period of 1948.

Classified Advertising

Rates for classified advertisements are ten cents per word, $2.00 minimum, except those of individuals seeking employment, where the rate is five cents per word, $1.00 minimum. Address all replies to Classified Advertisements with Box Number, care of AGRICULTURAL CHEMICALS, 254 W. 31st St., New York 1. Closing date: 25th of preceding month.

Positions Open

Field Representative: Agricultural chemical sales for large reputable manufacturer of basic insecticides. Degree in entomology, biology or equivalent experiment station or other experience required. Midwest or South-eastern territories. Address Box 406 care of Agricultural Chemicals.

Sales Staff Specialist: For Sanitation-Farm Supply Department. Work involves helping develop and promote new products and assisting the sales department on special campaigns and programs. Considerable educational work on the use of new products. Also contacts with production, buying, and advertising departments. Experience in agricultural chemical sales desirable. Education must include chemistry; knowledge of entomology and agronomy useful. Rural background helpful. Considerable platform work involved; should be able to handle fairly large audiences in group selling. Age range 27-33. Headquarters in St. Louis. Travel about one-third of time. Good salary with excellent future. Write complete details to A. W. Moise, Ralston Purina Company, Checkerboard Square, St. Louis, Missouri.

Positions Wanted

Chemical Sales Executive: 35, well known, completely grounded in agricultural and industrial markets (bulk and consumer package). Product development, field research and sales administration. Knowledge organic fungicides, herbicides, insecticides, detergents, antiseptics, germicides, textile finishes, resins, rubber compounds, emulsifiers, degreasers. Seeks responsible position with progressive manufacturer chemical or allied field. Locate New York or environs. Address Box 405, care of Agricultural Chemicals.

Agricultural Chemical Salesman: West coast states, graduate entomologist, age 33. 12 years experience with one manufacturer, Washington, Oregon, California salesman, sales management, research, liason, experimental, extension, regulatory people, labeling, advertising, insecticides, fungicides, weed killers, application equipment, tree fruits, nuts, field crops, row crops. Excellent production record. Desires sales territory. Available immediately. Address Box 403 care of Agricultural Chemicals.

Production Supervisor: College graduate with 8 years experience in a wide variety of insecticides desires a permanent position with an aggressive organization in the insecticide field. Address Box 404 care of Agricultural Chemicals.

Miscellaneous

Manufacturing Facilities: Large manufacturer in mid-west offers modern facilities for mixing, milling, packaging, etc. of chemicals, specialties, etc. Can handle large additional volume. Pack various size boxes, cartons, bags, drums. Opportunity for East or West Coast firm to manufacture low cost in mid-west. Can ship rail or own trucks. Full laboratory control. Experienced personnel. For further details, write Box 407 care of Agricultural Chemicals.

ALVIN J. COX, Ph.D.
Chemical Engineer and Chemist
(Formerly Director of Science, Government of the Philippine Islands. Retired Chief, Bureau of Chemistry, State of California, Department of Agriculture.)
ADVISER ON AGRICULTURAL CHEMICAL PROBLEMS AND INVESTIGATIONS
Consultant in reference to spray injury and damage, claims, including imports of fruits and nuts, formulas, labeling, advertising and compliance with law.
1118 Emerson Street
Palo Alto, California

FLORIDA FIELD TRIALS
Testing agricultural chemicals in the field during the winter months.
DR. G. R. TOWNSEND
P. O. Box 543
Belle Glade, Florida

Mich. Chem. Sells Pine Bluff

Michigan Chemical Corporation, St. Louis, Mich., announces the sale of its interest in Pine Bluff Chemical Co., Pine Bluff, Arkansas. The sale was made to the Niagara Chemical Division of Food Machinery and Chemical Corporation who are the joint owners and operators of Pine Bluff Chemical with Michigan Chemical.

Pine Bluff Chemical Co. was established in 1947 to manufacture DDT at facilities leased from the government arsenal at Pine Bluff. The first DDT was produced in June, 1947 and the plant has operated on a seasonal basis for the last 2½ years.

The sale of its interest in the Pine Bluff operation will be part of Michigan Chemical's program of concentrating their operations at St. Louis, Mich. Facilities for DDT production at St. Louis will be improved and expanded, it is reported by the company.

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PHYTOPATHS

(Continued from Page 31)

son, Ohio Agricultural Experiment Station, Wooster, on the use of low gallonage spray applications for control of vegetable diseases; another, "Measuring the Efficiency of Bordeaux Application," by Saul Rich, Connecticut Agricultural Experiment Station, New Haven; "Organic and Chromate Compounds as Seed Treatments," by S. E. A. McCallan, Boyce Thompson Institute, Yonkers, N. Y.; and "Orchard Tests with a Large Air-Blast Sprayer Modified to Apply Partial Concentrates," by A. B. Burrell, Cornell University. A section on Virology will complete the program. W. C. Price is chairman of this group.

The Society has announced that a special trip to the Boyce Thompson Institute for Plant Research will be available to those attending the meeting. Those who expect to make the trip are to see Dr. George McNew in the West Room of Hotel Martinique for details about special transportation.

Nebraska Weed Meeting

January 5 and 6 are the dates set for the fourth annual Nebraska Weed Control Conference, Chemical and Equipment Show to be held at the State Fair Grounds, Lincoln. According to E. H. Aicher, Lincoln, chief of the Division of Noxious Weeds for Nebraska, the University of Nebraska College of Agriculture will cooperate in staging the conference.

HEARINGS

(Continued from Page 20)

that marked our recent progress. This was to be expected during the period of intense activity when all agencies were striving to get the answers to questions that were raised by the introduction of these new materials.

Now the Food and Drug Administration of the Federal Security Agency has announced that it will begin a public hearing on January 17, 1950 "to take evidence on which to base regulations limiting the amount of added poisonous or deleterious residues on or in fresh fruits and vegetables." The cooperation of all agencies of government, federal and state, industry, farmers and others who have information bearing on this problem has been invited in the presentation of testimony. One of the important contributions expected of entomologists, plant pathologists and farmers will be the establishment of need for the use of pesticide chemicals. Definite evidence must be presented at the hearing as to why these chemicals are required in the production of fresh fruits and vegetables for the control of specific pests on specific crops.

The magnitude of the task is appalling since crops and pests vary so greatly from coast to coast, from north to south. Every item of relevant information must be brought forth. This is not the time to leave it to the other fellow to do the job, to take for granted that the need for pesticides is obvious, or to assume that any given material is safe to use. Evidence on residues following definite schedules of application must be presented, even though it may be incomplete.

The establishment of safe tolerances for agricultural pesticides is definitely in the public interest and deserves the full cooperation from all who can make a contribution. Pest control is also in the public interest and in recognition of this fact, the safe limit for residues of chemicals used to attain it must be determined. This balance between pest control on the one side and safety in our food crops on the other is going to be a difficult one to adjust precisely and practically. But adjusted it must be, safely and yet on a practical basis. Obviously we can't poison ourselves along with our food intake, but equally obviously we won't eat very well if we cannot retain the crop increases that effective use of modern insecticides has made possible.

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"Dis am lesson No. 1 in our new 1950 curriculum in de school for salesmen, Cuthbert"

Sales training . . .

ABILITY to "take it" again becomes an attribute of successful selling. Tough sales training has replaced the soft sales road of the past decade. But advertising can help cushion the blow for your sales staff, cut down the "outs," reduce your selling costs,—that is sensible advertising which concentrates on your customers and prospects and which doesn't sprawl all over the map.

Specifically, if you would improve your sales efficiency in the field of chemicals for agriculture, we suggest regular advertising in

AGRICULTURAL CHEMICALS

254 WEST 31st STREET NEW YORK 1

TALE ENDS

Some rather potent "ratistics" were presented by Chas. D. Thurmond, Monsanto Chemical Co., before the Pacific Chemical Exposition early in November. Mr. Thurmond traced the history of rodent control through the "dark ages" of witchcraft and sorcery up to the present methods of specific poisons for rat control. In summarizing, he said that there are more rats than people in the U.S.; that rats have caused more trouble, expense, suffering and death than all the wars combined; that these rodents cause damage each year estimated at $500,000,000 (mostly in agricultural products); and that rats destroy and eat as much food each year as 265,000 farmers produce in the same period.

•

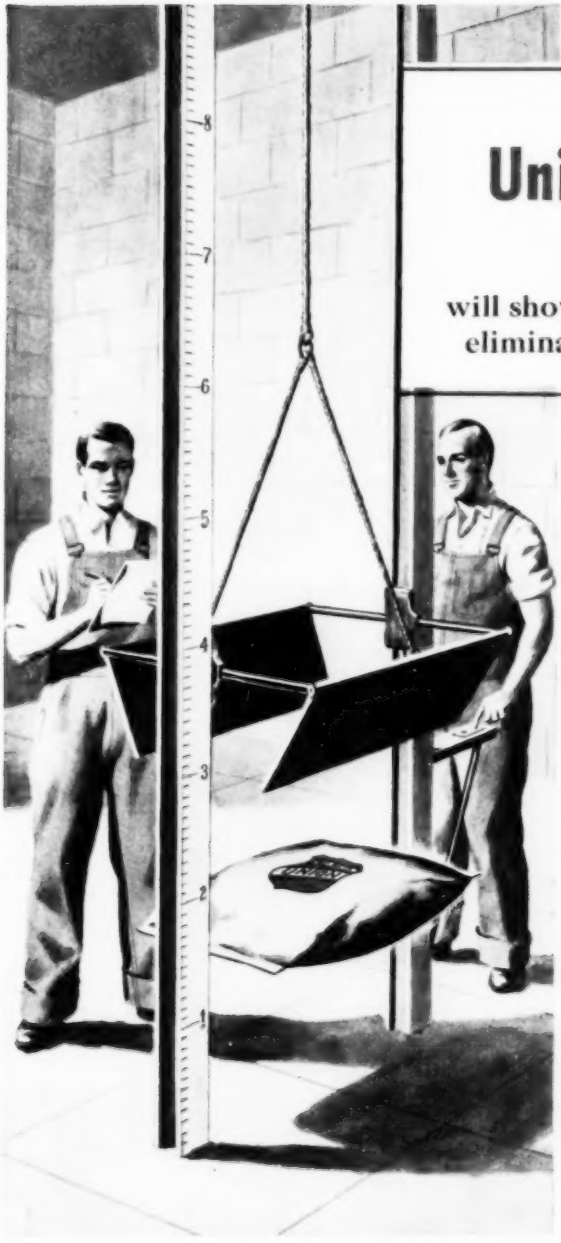
Tennessee Horticulture has reported a story where three old mallard ducks helped a Kentucky spray operator to impress his men that parathion must be treated with the utmost respect. Despite a safety lecture every morning, the crew members inclined toward carelessness, much to the anxiety of Frank Street, spray contractor.

The three ducks, waddling toward a pond on the farm, stopped briefly one morning, to touch their beaks to a tiny puddle the size of a silver dollar which had formed when a few drops of parathion had dripped on the ground. The ducks never got to the pond. A few steps beyond the toxic puddle they all dropped in their tracks, dead.

Moral: Mr. Street has had no trouble with his men since, in the matter of taking due precautions when handling toxicants — especially parathion.

•

A gardener of Ipswich, England, is said to have grown a chrysanthemum nine feet tall. And what kind of fertilizer did he use? He claims that the only plant food it received was the form of dregs from beer barrels. We are surprised that the plant was able to stand without reeling.



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will show you how quality control eliminates customer complaints!

SHIPPERS of more than 300 different products find Union Multiwall Bags reduce customer complaints and losses in shipping and handling. They are custom-designed with reserve strength for hard knocks.

Continuous testing in Union laboratories leaves nothing to chance. Bag paper is tortured and torn, burst and frayed. Loaded bags are dropped and tumbled and scuffed to discover any weak points, any need for strengthening.

Union Quality Control checks and rechecks every step in the making from timber to finished bag.

This constant checking and testing is a safeguard for every order of Union Multiwall Bags. So when your Union Multiwall representative calls on you, tell him the requirements of your product, its shipping and handling. You can be sure your delivered bags will live up to specification.

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Multiple Protection

Opens Easily

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Empties Clean

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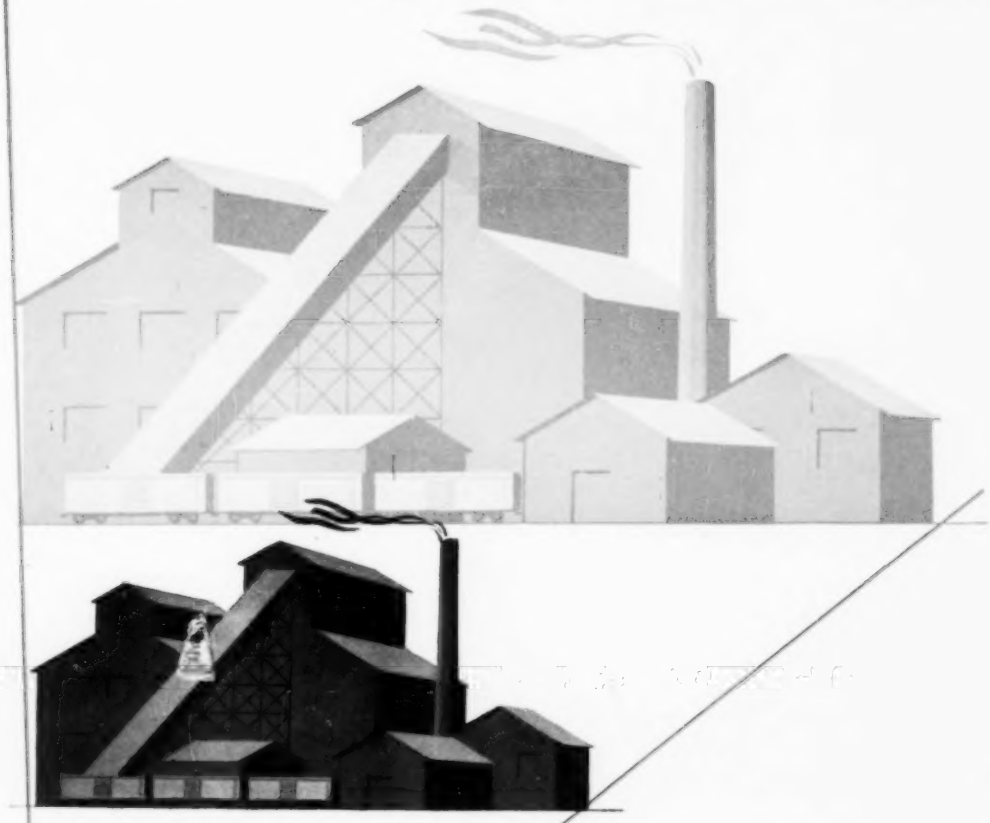
TRADE MARK UNION

more toxaphene for 1950



To meet the continually increasing demand for toxaphene (chlorinated camphene 67–69% Cl), Hercules has greatly expanded its production facilities at Brunswick, Georgia.

We urge insecticide manufacturers to place their orders early, so that production and distribution may be scheduled to meet requirements as they arise throughout the season.

HERCULES POWDER COMPANY
INCORPORATED
970 Market Street, Wilmington 99, Delaware

MAKERS OF TECHNICAL TOXAPHENE FOR AGRICULTURAL INSECTICIDES

N49-35